Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS PUBLICATION No. 104

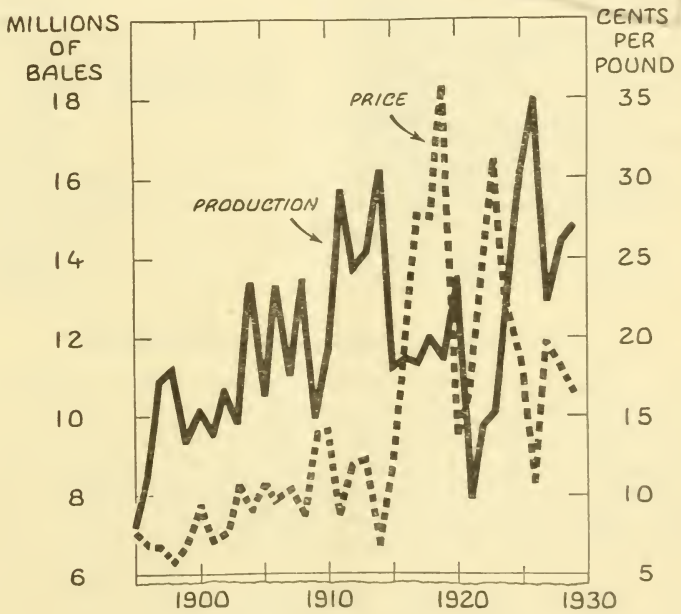
WASHINGTON, D. C. DECEMBER, 1930

THE WORLD COTTON SITUATION WITH OUTLOOK FOR 1931-32

AND

THE LONG-TIME OUTLOOK FOR SOUTHERN AGRICULTURE

Prepared by the Bureau of Agricultural Economics



BOTH PRODUCTION AND PRICES HAVE FLUCTUATED WIDELY IN RECENT YEARS

UNITED STATES DEPARTMENT OF AGRICULTURE

MISCELLANEOUS PUBLICATION NO. 104

WASHINGTON, D. C. Issued December, 1930

THE WORLD COTTON SITUATION, WITH OUTLOOK 1931–32 AND THE LONG-TIME OUTLOOK FOR SOUTHERN AGRICULTURE

Prepared by the *Bureau of Agricultural Economics*

CONTENTS

	Page
Permanent improvement the goal	1
Domestic demand	4
Foreign demand	9
Demand in Great Britain	11
Demand in France, Italy, and other western continental European countries	14
Demand in Germany, other central European, and Scandinavian countries	15
Demand in Russia	16
Demand in Japan	18
Demand in China	19
Demand in India	21
World total consumption	22
Competition from other fibers	24
World supply	25
Supply in United States	26
Supply in India	31
Supply in China	33
Supply in Egypt	34
Supply in Russia	35
Supply in other foreign cotton-producing countries	37
Prices of American cotton	37
Staple length of American cotton	40
Production, distribution, and carry-over of American cotton	42
Domestic consumption of some long-staple cottons	42
Staple length of foreign cotton	45
Prices of factors used in cotton production	46
Fertilizer expenditures	48
Costs per pound and per acre by yield groups	49
Costs per acre over the Cotton Belt	49
Competition between crops in domestic Cotton Belt	52
Tables	54
The cotton outlook 1931–32	59
Long-time outlook for agriculture in the Southern States	64

PERMANENT IMPROVEMENT THE GOAL

The South is again suffering from low cotton prices. In mid-October prices received by farmers for cotton averaged 26 per cent below the pre-war (1910–1914) average, and cottonseed prices were 6 per cent below the pre-war level. (Figs. 1 and 2.) Prices paid by farmers for things they buy at retail have gone down a little, but in comparison with prices farmers receive for cotton their decline is insignificant, and they still average almost 50 per cent higher than in the pre-war period.

Reviewing the past, the years 1904, 1908, 1911, and 1914 stand out in the pre-war period, and 1920 and 1926 in the post-war period, as years of low cotton prices. In some of these years prices were low because of overproduction, as in 1914 and 1926. In others of these years the low prices resulted from business depressions, as in 1908 and 1920. Undoubtedly much would be gained if farmers would plan their production in light of the fundamental developments taking place in supply and demand situations rather than in the light

of previously obtained prices. This would stabilize prices and incomes by avoiding periods of overproduction and reducing the effects of business depressions. In addition to the immediate situation there are certain long-time developments which may necessitate adjustments in production over a period of years and it is well to consider those problems before adjustments are forced upon us.

The United States is the outstanding producer of cotton and the largest individual consumer, but 56 foreign countries regularly re-

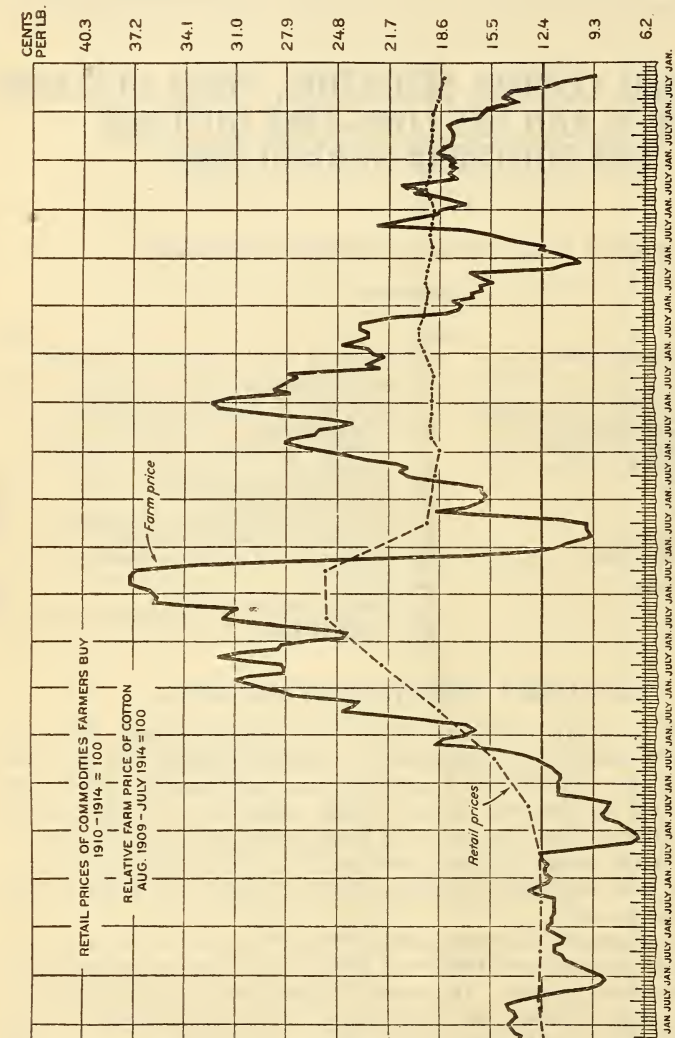


FIGURE 1.—FARM PRICES OF COTTON AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Cotton prices have fallen below the pre-war average and nearly to the level of the very low point reached in 1914. Every few years overproduction and business depressions cause cotton prices to decline to a very low level. The downward trend of all commodity prices since the World War has accompanied a downward trend in cotton prices. Both all-commodity prices and cotton prices have declined more than the retail prices of commodities farmers buy.

port production of cotton and over half the American crop is consumed in foreign countries. A review of conditions affecting the outlook for cotton, to be adequate, must be world-wide in scope. For the most part these conditions can be grouped as those affecting the quantities of cotton consumers will take at the prices they must pay, or the demand for cotton, and those affecting the availability, or the supply of cotton. Then the question of how the individual farmer can adapt his operations to these general conditions to make the most

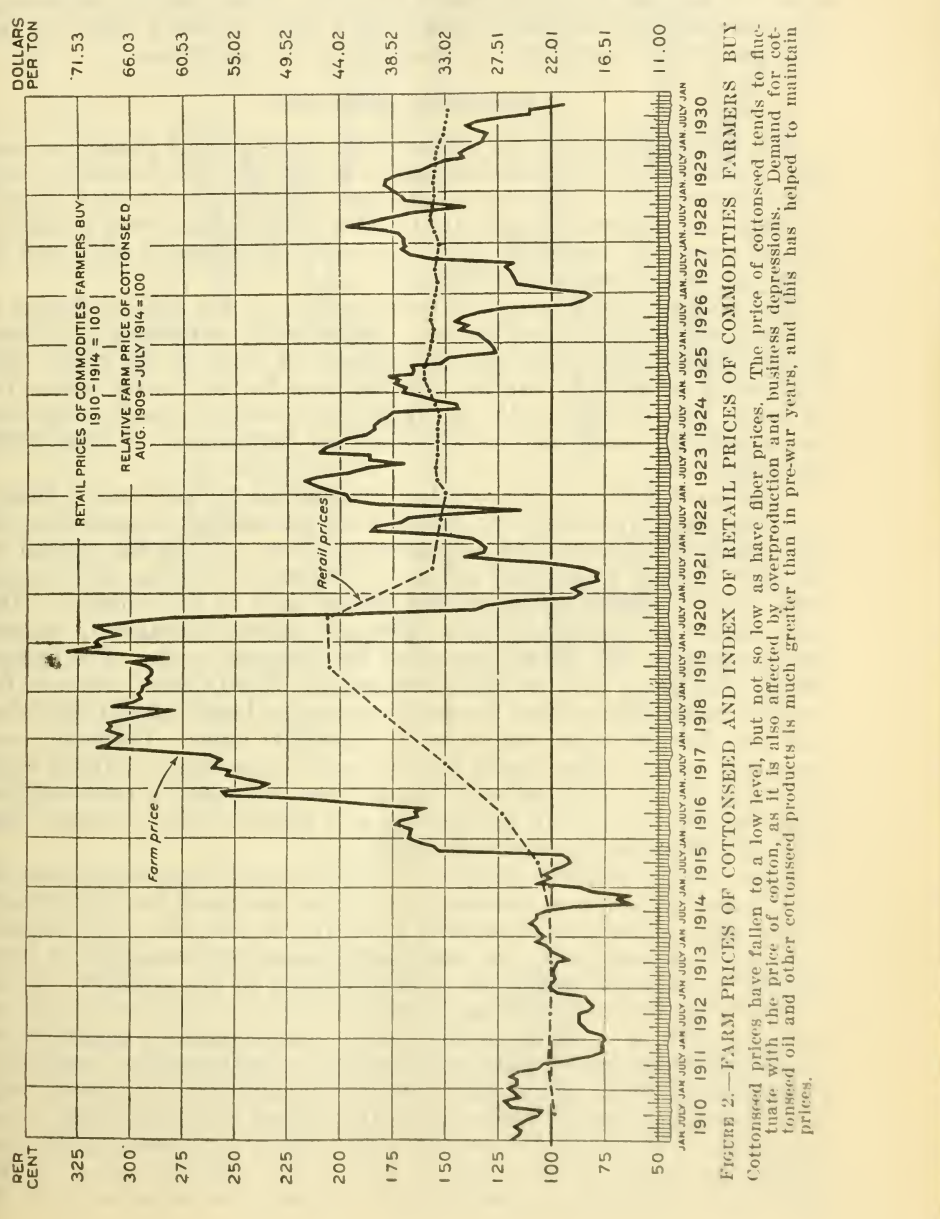


FIGURE 2.—FARM PRICES OF COTTONSEED AND INDEX OF RETAIL PRICES OF COMMODITIES FARMERS BUY

Cottonseed prices have fallen to a low level, but not so low as have fiber prices. The price of cottonseed tends to fluctuate with the price of cotton, as it is also affected by overproduction and business depressions. Demand for cottonseed oil and other cottonseed products is much greater than in pre-war years, and this has helped to maintain prices.

of his resources and local environment, must be considered. This requires a study of alternative opportunities and cost problems.

In dealing with the problems of the cotton producer it is necessary to consider both their immediate and their long-time aspects. We need to understand the present situation and find ways of coping with the difficulties that now face the cotton grower. Eventual price recovery has come from other periods of low prices, but only to be followed again by low prices and distress. Relief methods must be devised to bring about stability. The goal is permanent improvement and not merely temporary price recovery which in the past has led to a repetition of unsatisfactory conditions.

DOMESTIC DEMAND

The United States is the outstanding consumer of American cotton. Nearly three and one-half times as much of the American crop is consumed in this country as in Great Britain, the second largest consumer of American cotton. Of the total cotton crop produced in this country, around 40 to 45 per cent is consumed here and 55 to 60 per cent is exported. (Fig. 3.)

The general trend in cotton consumption in the United States is upward, although depression years temporarily reduce consumption. From 1900 to 1916 there was an increase of over 70 per cent. The depression of 1920–21 carried consumption to the lowest levels for 10 years, but thereafter the upward trend was resumed except for the reductions accompanying the business depressions of 1924, 1927, and 1930.

Prior to the World War cotton production in the United States increased rapidly enough to provide for increasing consumption in this country together with increasing exports. With the spread of the boll weevil, yields fell off and production for the three years 1921, 1922, and 1923 averaged the lowest since in the nineties. The high prices accompanying this shortage caused acreage to expand but production has barely exceeded the pre-war peak. Production for the five years 1910 to 1914 averaged 14,250,000 bales, whereas for the five years 1924 to 1929 production averaged only 15,000,000 bales, and for the last three years, only 14,500,000 bales. Domestic consumption, on the other hand, has increased more than 1,500,000 bales from the 1910 to 1914 period. The increase in domestic consumption exceeded the increase in production and exports have averaged less than in the immediate pre-war period.

From the immediate point of view, the growing importance of the United States as a consumer of cotton increases the importance of the effect of domestic demand upon prices and the total disposition of the cotton crop. In studying domestic consumption it is of interest to note the situations in each section of the country. Prior to 1900 the New England mills were the more important users of cotton. (Fig. 4.) Mills in the cotton States soon surpassed them in quantity consumed, but consumption in both regions continued upward until 1916. Since then cotton consumption in the New England States has declined whereas in the cotton-growing States it has increased. The South is now the great cotton-consuming as well as producing section of the country, and in the 1929–30 season its decline of 11 per cent in consumption amounted to twice as much in

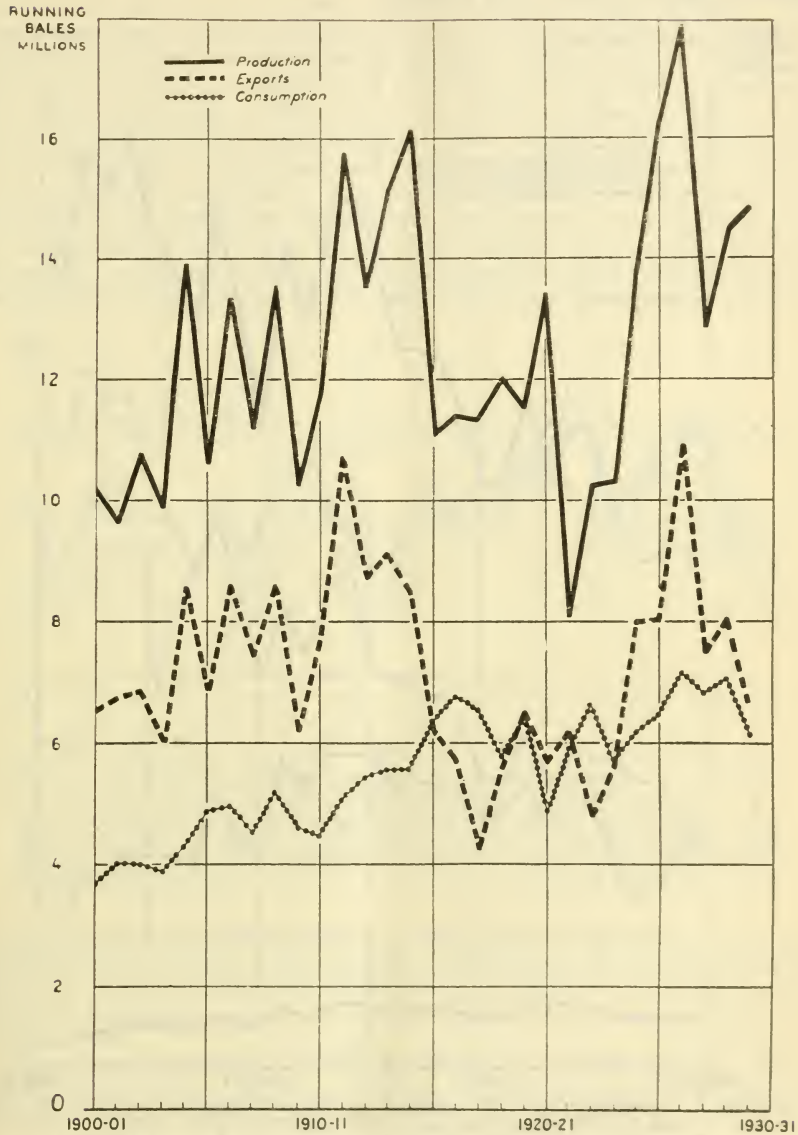


FIGURE 3.—UNITED STATES PRODUCTION, EXPORTS, AND CONSUMPTION OF COTTON

The United States sends over half of its cotton crop abroad, and extreme variations in production result in similar variations in exports. Domestic consumption is more stable than production and has increased at a fairly rapid rate through the last 30 years. As a result of the steady upward trend in domestic consumption without a corresponding trend in production, the exports during recent years have averaged less than during the five years just previous to the World War.

bales as the decline of 22 per cent in New England's consumption, and was more than twice as great as the total consumption of all States outside of these two groups.

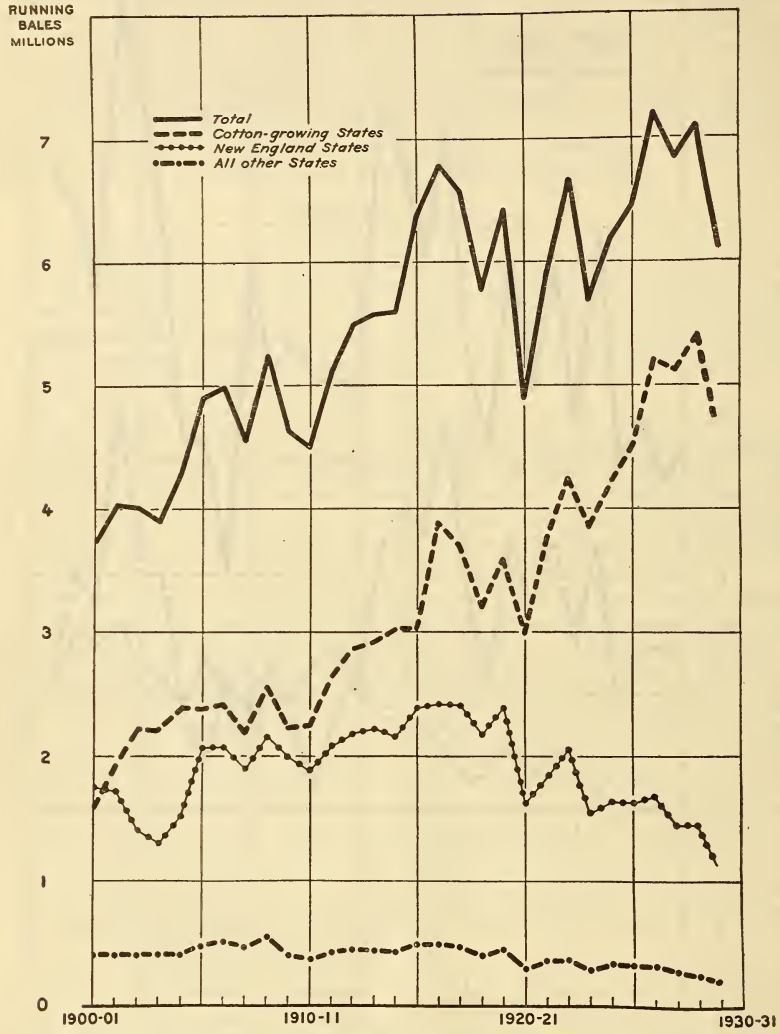


FIGURE 4.—CONSUMPTION OF COTTON IN THE UNITED STATES; TOTAL FOR COUNTRY AND FOR SECTIONS, 1900–01 TO 1929–30

A marked upward trend in the consumption of cotton in the United States has been accompanied by a marked shift within the country. Consumption has shifted southward from New England into the States where the staple is grown. During the last 30 years consumption in the Southern States has increased very rapidly, whereas in recent years consumption in the New England States has been declining.

The present business depression caused the consumption of cotton for the 1929–30 season in this country to fall 1,000,000 bales, or 14 per cent below that for the 1928–29 season. For the 11 months since November 1, 1929, consumption has averaged 22 per cent below the

corresponding months of a year earlier. Cotton consumption and the general level of industrial production characteristically move together. The general business situation has even more influence than have cotton prices on the rate of consumption in this country. For this reason it is worth while to observe the behavior of cotton consumption in previous depression periods rather closely. (Fig. 5.) The slight business recession of 1927 did not influence cotton consumption materially. The very low prices, following the record crop of 1926, carried consumption to peak levels in the 1926–27 season. The decline in consumption in late 1927, until stocks of finished goods could be consumed, was to be expected. During 1923 and 1924 cotton consumption fell off with the decline in the general level of industrial production, and recovered with its recovery, but the fall in cotton consumption was of much greater proportions, and the subsequent recovery was also greater than the decline and recovery

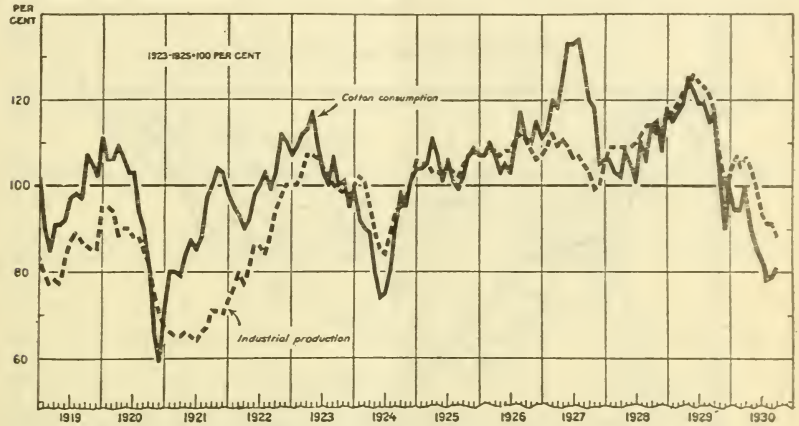


FIGURE 5.—MONTHLY COTTON CONSUMPTION AND INDUSTRIAL PRODUCTION IN THE UNITED STATES, 1919–1930

Cotton consumption in the United States moves with general industrial production. Both decline in periods of business depression, but cotton-mill activity usually declines faster and farther than does the average of all industries, and when recovery begins cotton consumption usually has increased more rapidly than industrial production.

of general industrial production. Cotton prices had been on a high level because of short crops and the depression did not show much effect on them, but when the larger crop of 1924 was harvested prices fell and the lower prices probably facilitated the improvement in consumption.

The severe depression and drastic deflation of 1920–21 reduced the rate of cotton consumption over 40 per cent from June to December, 1920, and caused farm prices to fall from nearly 37.5 cents per pound in April, 1920, to 9.8 cents per pound in March, 1921, around which level they remained until the 8,000,000-bale crop of 1921 caused them to rise. Then, too, the decline in cotton consumption was sharper and more severe than the decline in general business activity. The recovery in cotton consumption started in January, 1921, and was very marked whereas the recovery in business activity did not start until August and was more gradual. The sharp recovery in cotton

consumption was no doubt facilitated by low cotton prices, but once cotton consumption begins to recover from a depression it seems characteristically to proceed somewhat more rapidly than does the average of all industries.

Turning again to the present period, we observe that cotton consumption rose to a high level in 1929 along with general business activity, and then fell when business declined. As in the previous periods, the fall in consumption has been greater than the decline in business activity. Prices have reached the lowest levels since 1915.

Since the decline in domestic consumption is to be attributed to the business depression, the probable length of the depression becomes significant in this consideration. In previous major depressions in the United States, business activity declined 12 to 18 months from the peak, then began a gradual recovery. (Fig 6.) At its bottom, in 1921, industrial production was 33 per cent below the peak of 1920.

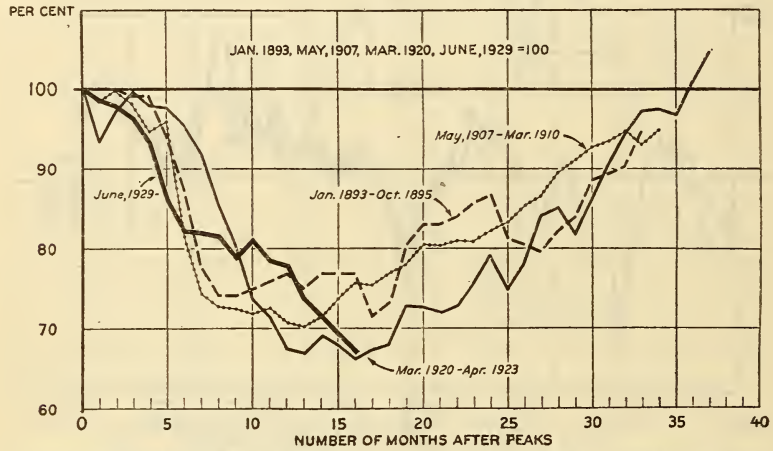


FIGURE 6.—TRENDS IN INDUSTRIAL ACTIVITY IN THE UNITED STATES FOLLOWING THE PEAKS OF 1893, 1907, 1920, AND 1929

Business activity in the United States has been declining during the last 16 months. In previous major business depressions business activity has declined through 12 to 18 months and then turned upward.

The present depression has been under way for 16 months, and in September the rate of industrial production was about 30 per cent below the peak reached in June, 1929. The influence of the drought on business recovery is still uncertain, and the course that depressions abroad may take is not clear, but unless the present depression is to be more severe than previous major ones, the downward course should not continue much farther. Since every important foreign country is involved in the present depression, recovery, when it comes, is likely to have the cumulative effects of a world-wide improvement,

The levels of commodity prices in general have been declining for several years. Conditions giving rise to such changes are complex and take a long time to work themselves out. In addition there has been a sharp drop in price levels during the past year. This drop has been due to the depression. Both of these changes

in price levels have occurred in foreign countries as well as in the United States. (Fig. 7.) Price levels can be expected to recover at least a part of their recent losses when business improves.

The present depression is world-wide. It was under way in central Europe early in 1928. Some industries, such as the building trades, were depressed in the United States throughout 1929, and business activity in general started downward in this country in July, 1929, although the depression did not become widespread until fall. Depression developed in Japan later in the winter. As an exporting country, Great Britain has felt effects of the depression on the reduced buying power of consumers in Asia, Africa, South America, and Australasia.

FOREIGN DEMAND

Demand for the 55 to 60 per cent of American cotton that is exported is influenced by the degree of prosperity and the state of

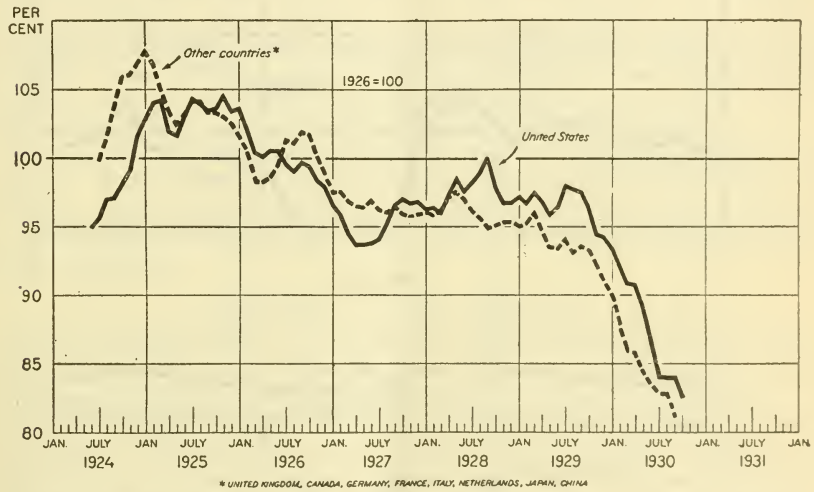


FIGURE 7.—INDEXES OF COMMODITY PRICES IN THE UNITED STATES AND IN COUNTRIES TAKING ABOUT 75 PER CENT OF UNITED STATES AGRICULTURAL EXPORTS

The present depression is world-wide. The general price levels in the United States and foreign countries move together. The trend of all commodity prices in the United States and in foreign countries has been downward since 1924, and this has been an important factor in the decline in cotton prices.

business generally in the countries to which it goes. Prior to the World War, Great Britain was the largest importer of American cotton. (Fig. 8.) Exports to the United Kingdom increased until 1911 when they amounted to nearly 4,250,000 bales. These large exports reflected Great Britain's position as a manufacturer of cotton goods and as a distributing center for raw cotton. Since 1911 the trend of exports to the United Kingdom has been downward and for the last three seasons they have averaged only 1,500,000 bales. This downward trend has resulted from the growth of cotton textile industries in other countries and the increasing volume of shipments direct from the United States to consuming countries.

The pre-war trend of cotton exports to Germany was definitely upward. The peak was reached in 1911 when they amounted to

3,000,000 bales. In the war years there were no exports to Germany, but after the war they again turned upward reaching 2,738,000 bales in the 1926–27 season. During the last two years they have been reduced by the depression in central Europe. Exports to France are roughly half as large as those to Germany, but they fluctuate comparatively little from year to year. This probably

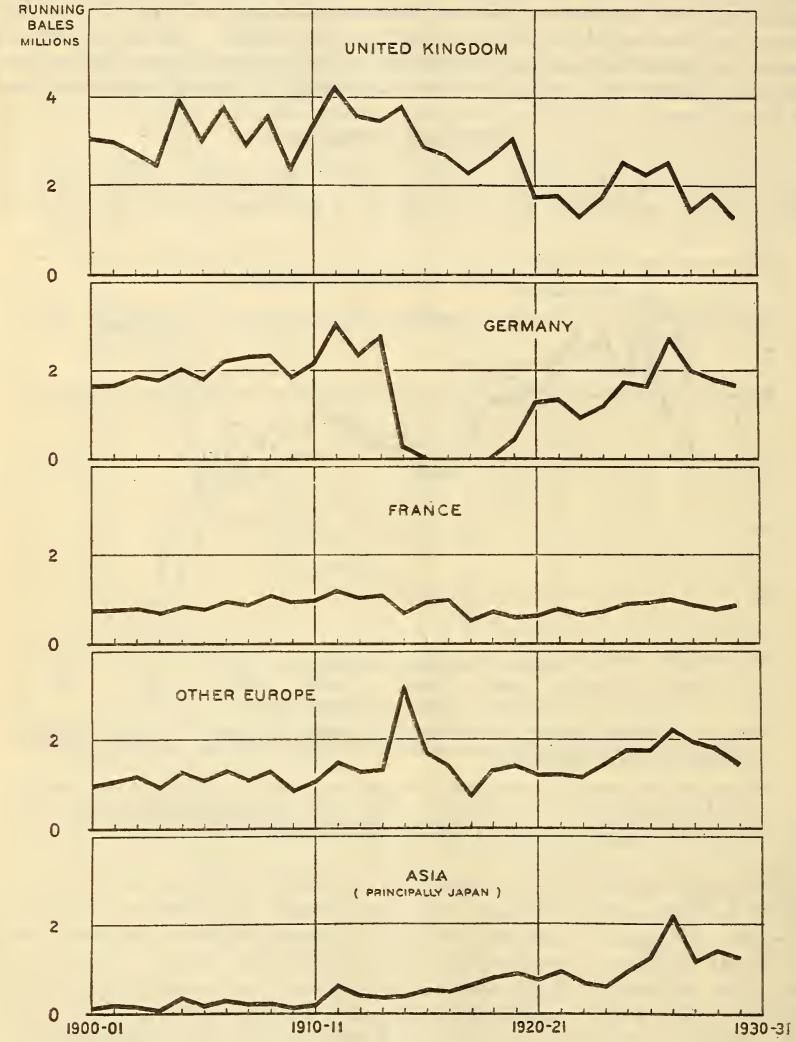


FIGURE 8.—EXPORTS OF LINT COTTON FROM THE UNITED STATES TO EUROPEAN COUNTRIES AND ASIA BY CROP YEARS, AUGUST 1 TO JULY 31, 1900–01 TO 1929–30

Before the World War more American cotton was exported to Great Britain than to any other country. Now Great Britain, Germany, other Europe, and Asia take nearly equal quantities. France takes about half as much as one of the others. Trends of exports are upward for Germany, other Europe, and Asia; constant for France; and downward for Great Britain.

reflects the stability of French domestic trade. Prior to the war exports to France rose gradually, and after the post-war depression they again rose, reaching 888,000 bales in 1924–25. Since 1924 they have held about constant. Total exports to the other European countries increased very slowly prior to the war, then mounted high temporarily in response to changed trade routes and war needs. After the war, exports to these countries increased through 1926, but since then they have declined again because of higher prices and depressions.

Japan is the great importer of American cotton in the Orient. For the last two seasons it has been second to Great Britain among foreign countries as a consumer of American cotton, and together with other Asiatic countries takes a quantity of American cotton about equal to the quantity taken by either Great Britain or Germany. Exports to Japan were very small prior to 1910, but they rose in response to the low prices of 1911. This gain was held, and further increases were made as Japan increased its cotton textile industry in the war years, and again as cotton prices fell from 1923 to 1926. Since 1926 exports to Asia have fallen from the record of 2,189,000 bales made that year, because of low prices and a short Indian crop, but most of the gains have been maintained.

As a basis for weighing the importance of conditions in any one country on our cotton export trade, exports may be considered as divided roughly into nine parts, one going to France and two each to the United Kingdom, Germany, other European countries combined, and Asia.

DEMAND IN GREAT BRITAIN

The long-time decline in the British cotton textile industry is similar to the decline in the New England industry and has given rise to a situation that may be characterized as a chronic depression. In actual development, depressions have hit the British industry harder and periods of prosperity have stimulated the British industry less than has been true in regard to the industries of other countries. In 1920–21 exports from the United States to the United Kingdom fell nearly 50 per cent; in 1926–27 they rose but little, and Germany took the lead as an importer of American cotton. Just how far the British cotton textile industry may decline is difficult to determine, but its important losses to date have come as a result of new industries having been developed in other countries to do the work formerly done by British mills. Nevertheless, in judging a current situation it must be kept in mind that periods of prosperity and depression will continue to affect the British cotton industry, even though the whole industry is on a lower level of activity than in former years. This situation is of special importance to the American cotton grower, as Great Britain is still the largest single foreign consumer of American cotton.

The present world depression has had an especially adverse effect on Great Britain's export trade. Although exports of cotton piece goods from Great Britain were not high in the 1928–29 season, August was the only month in the 1929–30 season when they were up to the average for the previous year. With only one exception they fell lower every month from January to September, 1930, when

they were below the lowest monthly level reached in the 1920–21 depression. (Fig. 9.) Exports of this type constitute a rather sensitive index of world business conditions. This falling off in exports of cotton piece goods from Great Britain may be taken therefore as reflecting particularly the adverse situations in Australia and New Zealand and several South American countries, the depression in continental Europe, and the effect of the fall in the value of silver on trade with China, and Indian trade disturbances. In attempting to estimate the duration of the period of subnormal British export trade it is necessary to consider the length of time that importing countries may continue with low rates of imports, the effects of low cotton prices on consumption, and the rapidity with which recovery can come from a world-wide depression of major proportions. That

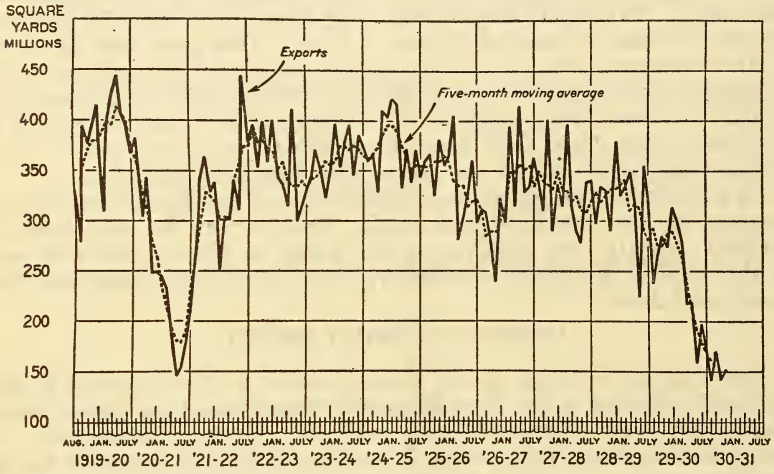


FIGURE 9.—EXPORTS OF COTTON PIECE GOODS FROM GREAT BRITAIN

British exports of cotton piece goods in September, 1930, were lower than at any time during the 1921 depression. Great Britain has gradually lost some of its export trade, but sharp declines such as occurred in 1920–21 and 1929–30 reflect world-demand conditions.

the recovery can be rapid once it gets under way is indicated by the rise in exports of piece goods during the latter half of 1920.

Two points need to be considered with respect to the level of cotton consumption in foreign countries. One point is the total consumption; the other is the consumption of American cotton. Great Britain consumes more American cotton than any other foreign country. Both the total consumption of cotton and the consumption of American cotton in Great Britain have fallen each season from 1924–25 to date, but the excessive decline in 1929–30 was more in response to the world business depression than to the declining tendency in the British cotton textile industry. (Fig. 10.) Last season's consumption was clearly subnormal.

Great Britain is the largest consumer of Egyptian cotton, and consumes a gradually increasing quantity of miscellaneous or sundries cottons and small quantities of Indian cotton. To some extent a different set of conditions influences the demand for materials made

from Egyptian cotton than influence the demand for materials made from other cottons, but there is an important degree of price competition between these cottons. During the last 10 years Egyptian Uppers cotton has averaged from 2 cents to 14 cents per pound above American Middling at Liverpool. In 1920–21, when Egyptian sold at 11½ cents above American, Great Britain consumed 21 per cent as much Egyptian as American cotton. In 1922–23 when Egyptian was only 2½ cents above American, Great Britain used 30 per cent as much Egyptian as American. From 1923 to 1926 demand conditions seem to have been especially favorable to Egyptian cotton but since 1926 they appear to have been more usual. The consumption of Egyptian cotton by Great Britain last season fell 95,000 bales, but its relative consumption, compared with American cotton, was high. This reflects the fact that prices of Egyptian

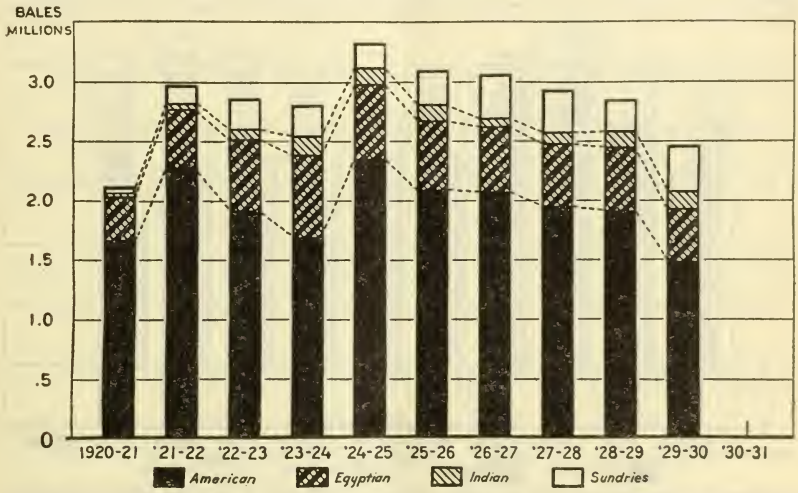


FIGURE 10.—GREAT BRITAIN: COTTON CONSUMPTION BY GROWTHS

Cotton consumption in Great Britain has been declining since 1924–25, but the reduction last season was largely a result of the present depression. Great Britain is the largest foreign consumer of American cotton and the largest consumer of Egyptian cotton. In addition, it is gradually increasing its consumption of sundries cottons and uses small quantities of Indian cotton.

cotton were comparatively low despite the efforts of the Egyptian Government to maintain prices.

When prices of sundries cottons are relatively low, more of these cottons are used at the expense of American cotton. During the years of short American crops their use increased until 265,000 bales were consumed in the 1923–24 season. In the 1926–27 season 362,000 bales were used. In 1928–29 the consumption of these cottons fell to 256,000 bales but in 1929–30 it rose to 376,000 bales.

A gradual increase in consumption of sundries cottons can be expected but the largest increases will probably continue to come in years when their prices are comparatively low. The Egyptian Government is continuing its activities to maintain prices of Egyptian cotton but the cotton acreage of that country has not yet been reduced. Moreover, Egyptian cotton is now at a disadvantage when competing in the United States (which has been the second largest

individual consumer of Egyptian cotton) and this fact will probably serve to add to the supply that will be offered on the British market.

DEMAND IN FRANCE, ITALY, AND OTHER WESTERN CONTINENTAL EUROPEAN COUNTRIES

The countries of southwestern Europe form a relatively stable cotton-consuming area of growing importance. Approximately two-thirds of the cotton consumed by this group of countries is American. Indian, Egyptian, and sundries cottons are used in the order named. While these countries were recovering from the post-war depression in 1921 to 1923, the price of American cotton was high and they turned more to other growths. With the decline

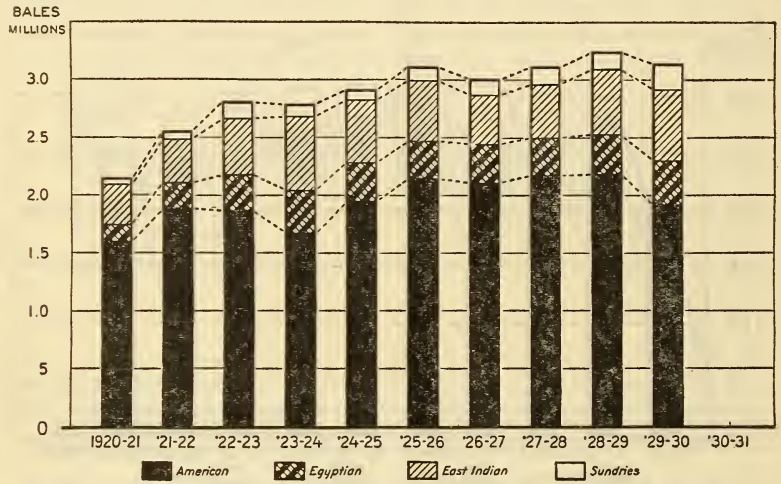


FIGURE 11.—FRANCE, ITALY, AND OTHER WESTERN CONTINENTAL COUNTRIES: COTTON CONSUMPTION BY GROWTHS

The trend of cotton consumption in western Europe is gradually upward. Consumption of sundries cottons is small but increasing. In 1929–30 the consumption of American cotton was reduced, but the consumption of Indian and sundries increased. Consumption of American increased after the depressions of 1920–21 and 1923–24.

in relative prices of American cotton, from 1923 to 1926, they used proportionately more American cotton, but in 1927–28 and 1928–29 the increase in consumption was in foreign growths, and in 1929–30 the decline in consumption of American cotton was over twice as great as the decline in total consumption. (Fig. 11.)

The small decline in total consumption in 1929–30 under the record consumption of 1928–29 reflects the small extent to which the depression had on the whole affected these countries up to the end of the 1929–30 season. Although a falling off in their trade was noted, it was not serious, since in France particularly business conditions and demand continued at high levels throughout the season. Recently reports have indicated somewhat less optimism in France that the world depression can continue to be so largely avoided there as it was last year.

DEMAND IN GERMANY, OTHER CENTRAL EUROPEAN, AND SCANDINAVIAN COUNTRIES

Central and northern European countries consumed a little over three-fourths as much cotton in 1929–30 as did the southwestern countries, and three-fourths of the cotton they consumed was American. About 16 per cent of the cotton they consumed was Indian, less than 7 per cent was Egyptian, and less than 3 per cent was sundries. Germany is the country of outstanding importance in this group. The recovery from the post-war depression in these countries was very slow, but from 1920–21 to 1927–28 their total cotton consumption nearly doubled. (Fig. 12.) As a matter of fact, the favorable demand conditions in these countries during 1927–28 probably go a long way in explaining the extent of the recovery of cotton prices from the low point reached in 1926. Dur-

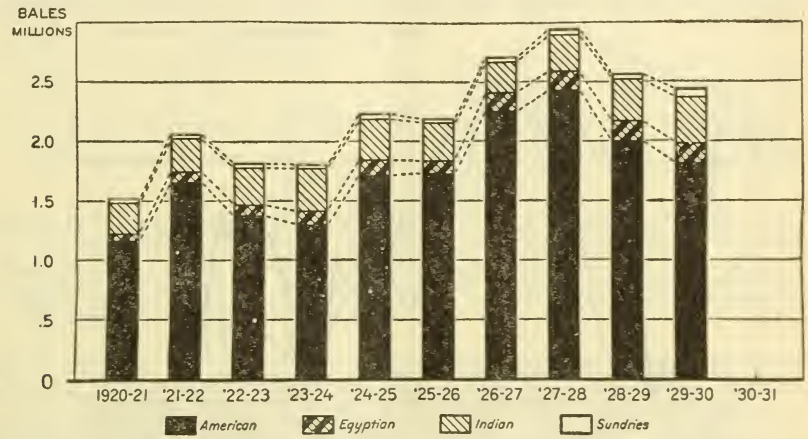


FIGURE 12.—GERMANY, OTHER CENTRAL EUROPEAN, AND SCANDINAVIAN COUNTRIES: COTTON CONSUMPTION BY GROWTHS

Recovery from war conditions resulted in an upward trend of cotton consumption in central and northern Europe. The depressions of 1920–21 and 1923–24 were followed by marked increases in the consumption of American cotton. Low cotton prices following the crop of 1926 and increased consumer buying power caused consumption to rise to high levels during 1926 and 1927. The decline during the last two years has been due in large part to the business depression.

ing the last two seasons depressions in these countries have caused consumption to decline, the total for 1929–30 being 500,000 bales below the peak of 1927–28. In these countries as in western Europe, the relatively high prices for American cotton during the period from 1921 to 1924 caused a shift toward foreign growths, and since then there has been a moderate increase in the consumption of these cottons. During the last two years the reductions in consumption have been entirely at the expense of American cotton and the consumption of foreign growths has increased.

The development of the depression in central Europe is well demonstrated by an index of activity in the cotton textile industries of Germany and the imports of cotton yarn and cloth into Germany. (Fig. 13.) The export trades of Austria, Poland, and Czechoslovakia have been depressed, and the domestic demands of these

countries have been reduced. The depressions have been so persistent that they discourage hopes for an immediate recovery. Nevertheless it seems significant that activity in the Polish cotton industry has recently turned sharply upward; also reduced mill activity has kept stocks of finished goods at low levels. To effect substantial trade recovery, however, an increase in consumer buying power or a continued period of low prices for finished products will be required.

Both central and western continental European countries shift their consumption between American and foreign cottons, depending upon which is the cheapest. The relationship between price differences and relative consumption of American and Indian cotton for these countries is shown in Figure 14. In 1923–24, when American cotton sold at 8½ cents a pound over Indian cotton at

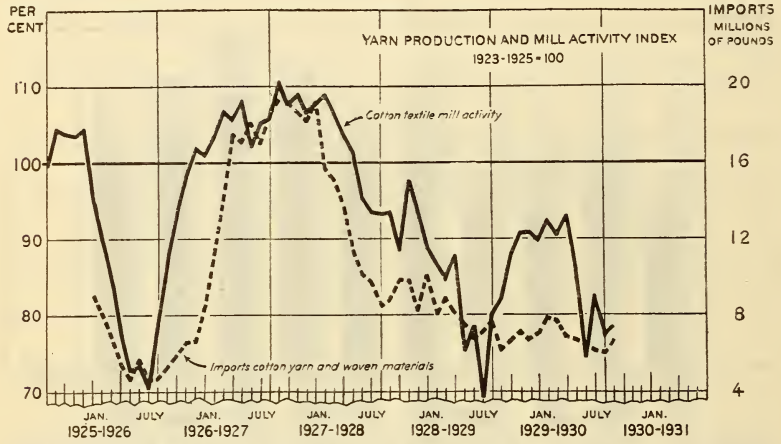


FIGURE 13.—GERMANY: COTTON-MILL ACTIVITY AND IMPORTS OF COTTON YARN AND WOVEN MATERIALS

Germany consumed large quantities of cheap cotton through the 1926 and 1927 seasons, and in addition imported large quantities of cotton yarn and woven materials. But when the depression began in 1928 mill activity and imports declined sharply and continued downward through the season. This was followed by only a short-lived revival in 1929. The reduction of imports of yarn and woven materials into Germany has contributed to the depression of the textile industry in other central European countries.

Liverpool, these countries used only three times as much American as Indian, but in 1926–27, when the price for American was only 2½ cents over the price for Indian, they used nearly six and one-half times as much. In addition to using more of the cheaper cotton they purchased more of it for future use, so that the effect of the relative prices can be seen the following year as well.

DEMAND IN RUSSIA

Changes in the political and economic organization of Russia have caused its development of cotton consumption to be different from that of the rest of Europe. The Soviet Government is making strenuous efforts to increase the output of the Russian textile industry and has been successful in making some increase each year from 1922–23 to 1928–29. During 1929–30 their consumption

fell off slightly, partly because of Russia's financial stringency. (Fig. 15.) About three-fourths of the cotton consumed in Russia is classed as sundries, and of that practically all is Russian-grown

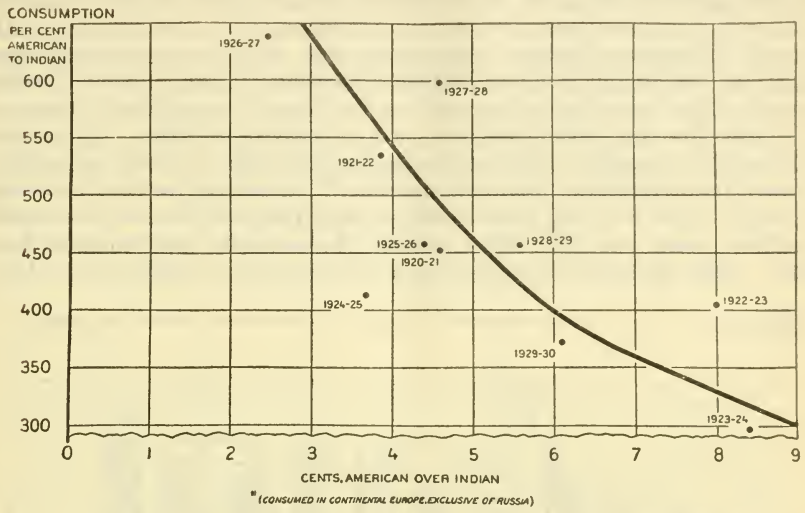


FIGURE 14.—SPREAD IN PRICE OF AMERICAN OVER INDIAN COTTON AND RELATIVE CONSUMPTION OF AMERICAN TO INDIAN COTTON

When the spread in prices between American and Indian cotton is small Europe turns to American cotton, but when American cotton sells considerably above Indian, Europe turns more to Indian cotton. For extremes, compare 1926–27 with 1923–24.

cotton. Up to 1927–28 the consumption of American and Egyptian cotton increased each year, but during the last two years the consumption of each of these cottons has declined. Last season, however, Russia used some Indian cotton for practically the first time since the World War.

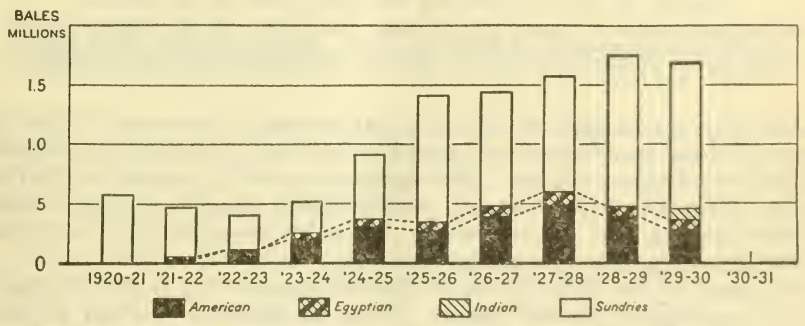


FIGURE 15.—RUSSIA: COTTON CONSUMPTION BY GROWTHS

Russian cotton consumption has increased rapidly and the Soviet Government plans large increases in the future. Last season Russian consumption decreased slightly and some Indian cotton was used, both developments probably reflecting restricted foreign purchasing power. Russia produces most of the cotton it consumes.

There seems little reason to doubt that Russian consumption will continue to increase, but the efforts to develop domestic supplies may cause Russia to be less important as a buyer of American cotton.

DEMAND IN JAPAN

Japan is the most important cotton-consuming country in the Orient. About one-half the cotton Japan consumes is Indian cotton and about two-fifths is American cotton. Most of the sundries cottons Japan uses come from China. Japan also uses small quantities of Egyptian cotton. Japan is one of the most important countries reflecting the competition between American and Indian cotton. The trend of consumption in Japan is definitely upward and that for the 1929–30 season was a record to date. (Fig. 16.) Although the trend in total consumption in Japan has been gradually upward, the trend in the consumption of American cotton has come in steps. The last big rise in the consumption of American cotton in Japan came in 1926 when prices of American cotton were low. Since 1926 Japanese consumption of American cotton has been

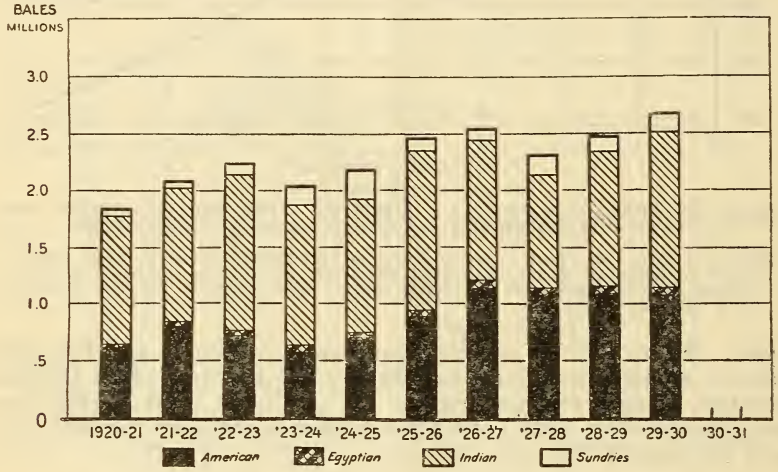


FIGURE 16.—JAPAN: COTTON CONSUMPTION BY GROWTHS

Cotton consumption in Japan is increasing. Low prices in the 1926–27 season boosted the consumption of American cotton. During the last three seasons consumption of American cotton has changed but little, whereas the consumption of Indian has increased at a rapid rate.

practically unchanged at about 1,100,000 bales per year. The increase in total consumption during the last two years has gone almost entirely to Indian cotton. The proportion of American to Indian cotton used by Japan varies considerably depending upon their relative prices, but since 1926 the relative demand for American cotton has been stronger than formerly.

For most of the 1929–30 season the Japanese cotton textile industry was operating at record levels. Yarn production reached a peak and exports of cotton cloth were high. After December, 1929, however, the yarn production began to decline in response to a general depression affecting Japan. Exports have also fallen. As a result the Japanese cotton textile industry ended the season at the lowest levels of activity in several years. (Fig. 17.) In considering the outlook for Japanese consumption, therefore, it is necessary to consider the extent and probable duration of the depression in Japan.

To a considerable degree the Japanese depression is a reflection of the general world depression, although Japan was affected somewhat later than were many other countries. The world depression has greatly reduced the price of silk and the income from silk exports. It has also had an adverse influence on the exports of Japan's other manufactured products. Purchasing power of Japanese consumers, therefore, has been materially reduced. In addition to the more general conditions, the Japanese depression reflects especially the monetary conditions of Japan and China. Gold is the basis of Japanese money. In 1929 Japan lifted its embargo on gold to permit its free export. This increased the exchange rate between Japanese and other gold moneys and made it easier for Japan to buy foreign goods but more difficult to sell its own goods. China, on the other hand, is the most important market for Japanese cotton

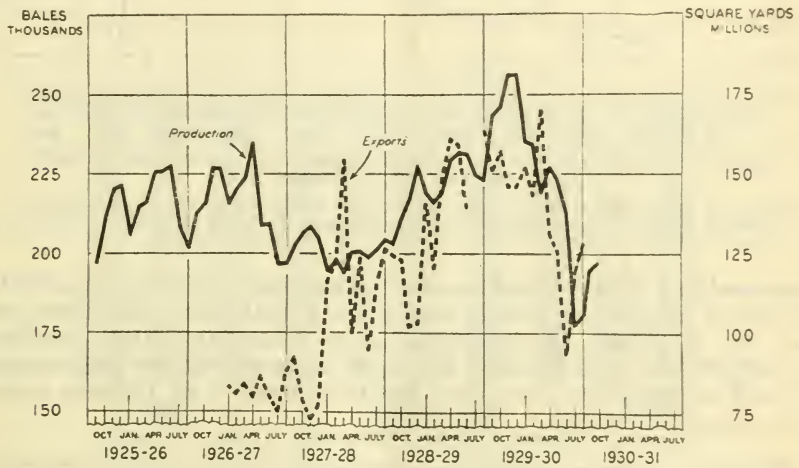


FIGURE 17.—JAPAN: PRODUCTION OF COTTON YARN AND EXPORTS OF COTTON CLOTH

Japanese cotton textile activity and exports of cotton cloth increased rapidly from 1927 to the beginning of 1930. Late in the 1929–30 season activity and exports declined sharply to low levels. A partial recovery took place in the early months of the 1930–31 season.

goods and its money is based on silver. Silver has been growing less valuable for several years and during the 1929–30 season the value declined sharply. China has therefore been less able to purchase foreign goods. This was one of the important factors in the recent decline in Japan's cotton cloth export trade. (Fig. 18.) More recently Chinese exchange rates have improved slightly and if this improvement is maintained it will make China a better market for foreign goods. To date, however, Japan does not appear to have made any very substantial recovery from its depression.

DEMAND IN CHINA

Cotton consumption in China has increased steadily during recent years. This substantial growth was offset only in 1928–29 when civil strife interfered with trade. During the 1929–30 season the falling value of silver favored the purchases of cotton goods from

mills in China rather than from foreign countries, and the use of Chinese rather than foreign cotton. About two-thirds of the cotton

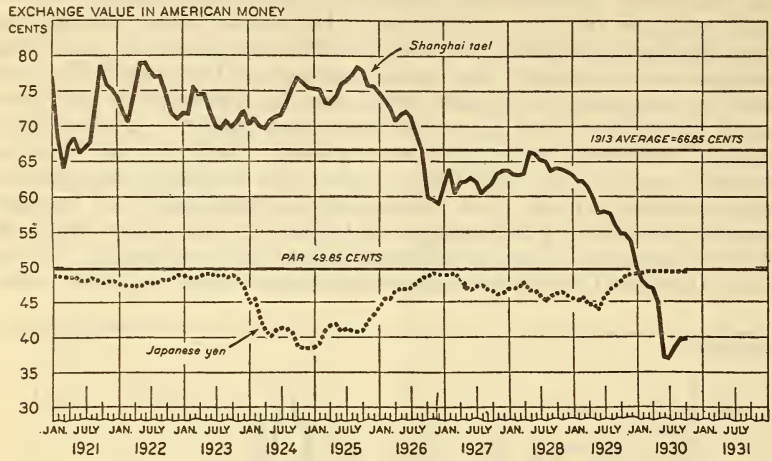


FIGURE 18.—EXCHANGE VALUE OF CHINESE AND JAPANESE MONEYS, JANUARY, 1921, TO OCTOBER, 1930

The sharp fall in the value of silver in 1929 and 1930 lowered the buying power of China's money. Japan's money rose in exchange value in 1929 and this made Japan less able to undersell other countries on the export market.

consumed in China is listed as sundries cottons, and this is practically all grown in China. China uses more Indian than American cotton. As in Japan, the consumption of American cotton increased in 1926–27 and this increase has been maintained, but the increase in total consumption since then has been made with Chinese rather than American cotton. (Fig. 19.)

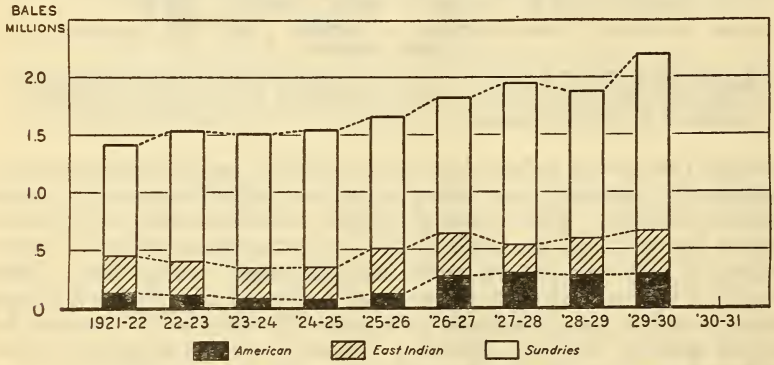


FIGURE 19.—CHINA: COTTON CONSUMPTION BY GROWTHS

China consumes some American and Indian cotton, but consumes mostly the cotton of its own fields. Mill consumption is increasing in China at a fairly rapid rate. Large supplies at low prices in 1926 boosted the consumption of American cotton in China, but during the last three years the consumption of American has remained about stationary, whereas that of Indian has increased. During the 1929–30 season Chinese cotton contributed largely to the increased cotton-mill output.

China must be viewed from the standpoint of a domestic consumer of raw cotton and as a market for finished goods. As a market

for goods from other countries, the stabilization or improvement in the value of silver will help the Chinese situation. If the recent improvement continues, it will benefit Great Britain and Japan materially. An improvement in the value of silver would also make it easier to sell raw American cotton to China. The most important factor affecting the cotton textile industry within China is the degree of freedom of China's trade routes. Civil strife frequently hampers the domestic textile trade. During the early months of the 1930–31 season there has been little difficulty from this source. The general trend of cotton consumption in China will undoubtedly be upward if for no other reason than that modernization will cause

FIGURE 20.—INDIA: COTTON CONSUMPTION BY GROWTHS

Cotton-mill consumption in India fluctuates considerably from year to year, but shows no definite trend. India uses small quantities of American and sundries cottons.

cotton spinning to be done in mills rather than in the homes as is now the case in much of interior China.

DEMAND IN INDIA

India is the largest user of its own cotton. India's consumption shows no well-defined trend, although it varies widely from year to year. (Fig. 20.) Indian mills depend almost entirely upon Indian cotton, but there was some increase in the consumption of American cotton as a result of the low prices of American cotton and a short Indian crop of 1926. Since 1926 the consumption of American cotton has become insignificant again.

Consumption of cotton in India is important from two opposite points of view. In so far as a high rate of consumption may result from a strong Indian demand it causes less cotton to be thrown on the export markets to compete with American cotton. On the other hand if it results simply from a displacement of imports, then the trade of Great Britain, a consumer of American cotton, is injured and the demand for Indian cotton is correspondingly strengthened. During 1929–30 India's consumption was high. India has

raised its tariff rates to benefit its cotton industry. To just what extent the general world depression may affect India is difficult to determine, but late in the 1929–30 season there were some scattering reports of reductions in the rates of activity in India's cotton mills. In view of the high rate of consumption during 1929–30 it seems probable that any increase in India's consumption would reflect low prices or a displacement of imports rather than a strengthening of consumer demand.

WORLD TOTAL CONSUMPTION

The total world consumption of cotton has increased materially since the postwar depression of 1920–21. (Fig. 21.) American cotton constitutes approximately three-fifths of the total. From 1921 to 1923 the small supplies and high prices of American cotton

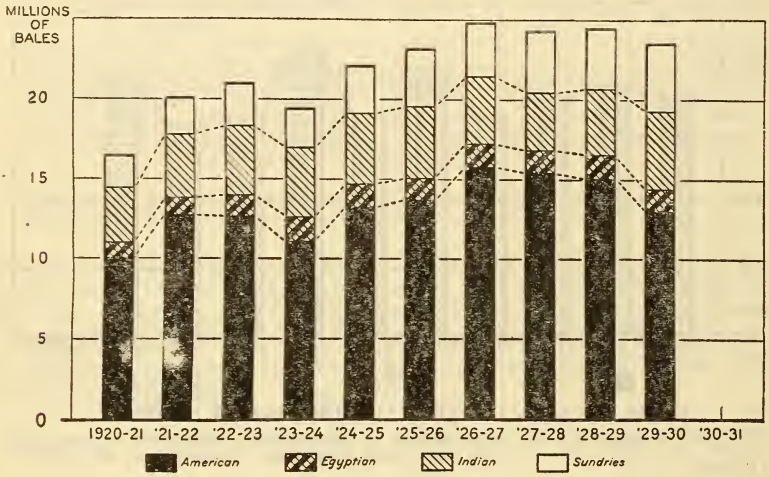


FIGURE 21.—WORLD: COTTON CONSUMPTION BY GROWTHS AND TOTAL

The trend of world cotton consumption from 1920 to 1926 was definitely upward, but since then there has been a slightly downward tendency. Foreign growths have displaced American cotton to some extent during recent years. During last season the depression reduced the world's total consumption, but the consumption of the foreign cotton growths increased over the previous season.

induced consumers to turn to other sources of supply. General world developments and improvement in trade conditions have caused further increases in foreign cotton crops and in the consumption of foreign cotton in the world's mills. This gradual development is shown in the increases in consumption of sundries cottons and of Indian and Egyptian cottons. Since these increases so largely reflect fundamental developments they will probably continue. The larger crops of American cotton and the lower prices from 1923 to 1926 led to an increased consumption of American cotton, but the peak attained in 1926–27 has not been equaled since. During the last two years comparatively low prices for non-American-grown cottons, and the continued development of Russian and Chinese supplies have caused increases to be shown in the total consumption of other cottons at the expense of American cotton. In 1929–30 the world total consumption of cotton declined, but the reductions

took place mostly in American cotton and slightly in Egyptian cotton, whereas the consumption of Indian and sundries cottons increased. To an extent this reflects increasing competition from sundries and Indian cotton and the year-to-year shifts in response to changes in relative prices. However, of the increase in world consumption of Indian cotton, approximately five-sevenths occurred in the three oriental countries, where the Indian crop always furnishes the bulk of the supply, and nearly one-seventh occurred in Russia where the cheaper Indian cotton was probably taken because of financial conditions.

The principal cause for the 2,000,000-bale reduction in world consumption of American cotton during the 1929–30 season was clearly the business depression in American and European countries where

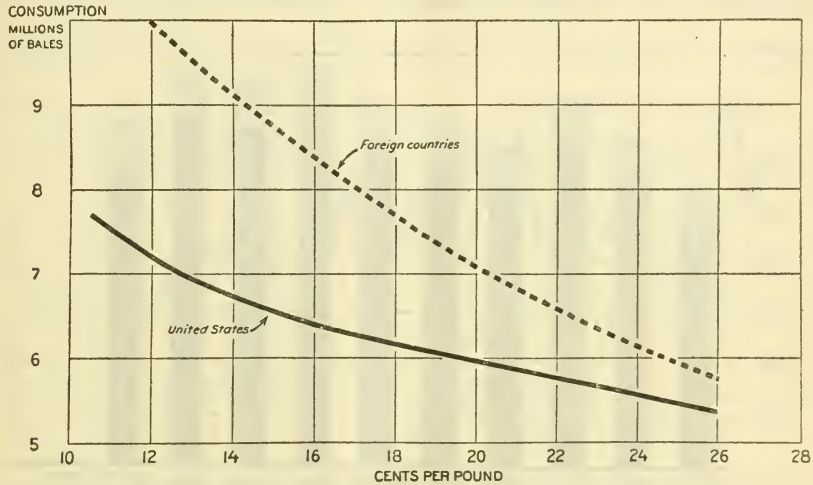


FIGURE 22.—RELATION BETWEEN PRICES AND CONSUMPTION OF AMERICAN COTTON, UNITED STATES AND FOREIGN COUNTRIES

Low prices stimulate cotton consumption in foreign countries more than in the United States. Changes in business conditions affect the consumption of cotton in the United States more than do changes in prices. During the last few years an increase in prices from 12 to 20 cents has had a tendency to reduce consumption in the United States only about 1,000,000 bales, whereas in foreign countries it has reduced consumption of American cotton by about 3,000,000 bales.

most of the American crop is consumed. There was some turning to foreign-grown cottons in these countries because they were cheap in comparison with American cotton. The world business depression did not effect Japan and India soon enough to offset the gains in consumption made early in the season, and in China internal conditions gave rise to an increase in consumption. The 1929–30 consumption of American cotton was below the level to be expected when demand conditions became normal. The consumption of Indian cotton was larger than usual, and constituted a larger proportion of the total than would be expected with average relationships between the price of American and Indian cotton.

Low prices stimulate the use of cotton. For that reason consumption tends to be high when prices are low, and to be restricted when prices are high. Foreign countries are more sensitive to prices than is the United States. (Fig. 22.) In this country business con-

ditions, which reflect demand, have a much greater influence on consumption than have prices. In foreign countries business conditions are important, but the level of prices is very significant. Moreover, low prices for American cotton make it compete more successfully with foreign-grown cotton in satisfying the total consumption requirements.

COMPETITION FROM OTHER FIBERS

Rayon is now being used in place of cotton and other fibers for many purposes. There has been some apprehension as to the effect this will have on the cotton industry. During the last ten years the quantity of rayon used in the United States has increased 11 times. Nevertheless, silk consumption has increased 2½ times, wool consumption has increased some, and cotton consumption has in-

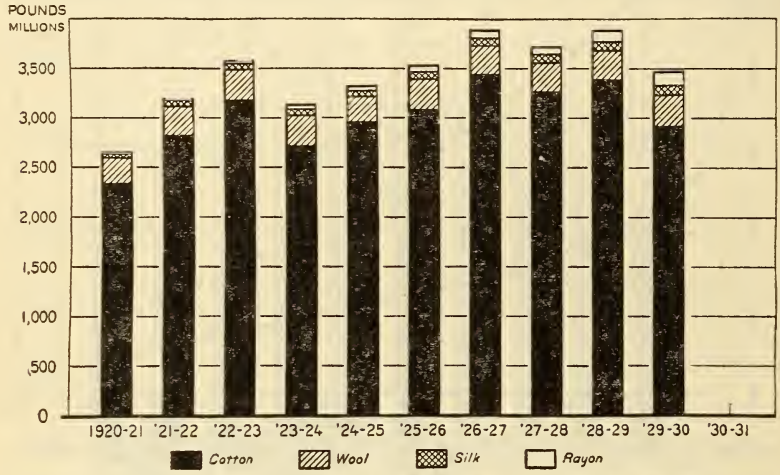


FIGURE 23.—UNITED STATES: CONSUMPTION OF COTTON, WOOL, SILK, AND RAYON

Cotton is the outstanding textile fiber of the United States. Wool has held its position without much change during the last 10 years. Consumption of both silk and rayon has increased at a fairly rapid rate. Rayon has displaced cotton to some extent, but it is still of minor importance among the textiles of this country. The industrial consumption of cotton has been increasing and is likely to continue to do so for some time.

creased by one-fourth. (Fig. 23.) Silk and rayon have largely displaced cotton for certain uses, but these losses have been more than compensated by increased uses of cotton for other purposes. Cotton is still the important textile fiber for the United States. During the last season cotton constituted 84 per cent of the total poundage of these fibers consumed in the United States, wool 9 per cent, silk 3 per cent, and rayon 4 per cent. During the previous season, for which the figures show a more usual comparison, cotton constituted 87 per cent of the total and the other materials were 8 per cent, 2 per cent, and 3 per cent, respectively. It is reasonable to conclude that the use of rayon will continue to increase, and that rayon will constitute an increasing percentage of the total consumption of all fibers, but so far there is nothing to indicate that the upward trend in cotton consumption will not continue.

WORLD SUPPLY

The world production of cotton has averaged 26,500,000 bales for the last five years. Of this total the United States produced 15,300,000 bales or 58 per cent, and foreign countries produced 11,200,000 bales. Because of its large size, changes in the American crop contribute largely to changes in the total world supply of cotton. American cotton competes on the one extreme with the long-stapled, cotton of Egypt and on the other with the short cottons of India and China. India, China, Egypt, and Russia are the most important foreign producers, and of these, India and Egypt are most important in world trade.

The trend of cotton production abroad is upward and has followed much the same course as has production in the United States.

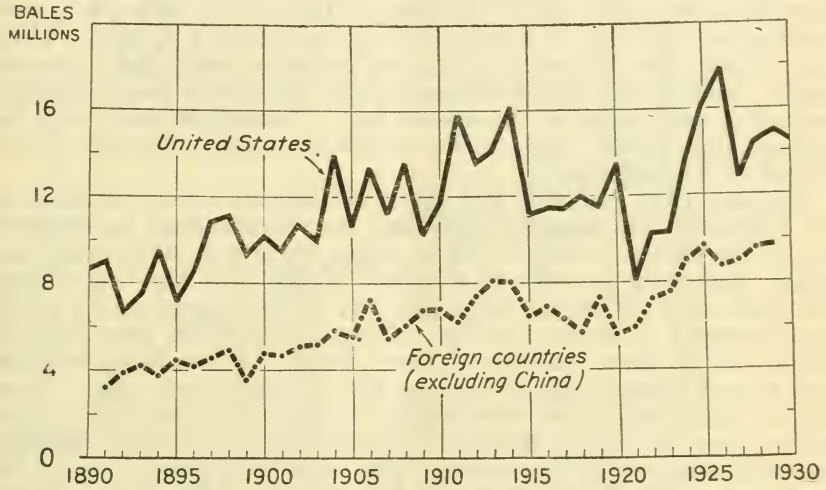


FIGURE 24.—COTTON PRODUCTION IN THE UNITED STATES AND FOREIGN COUNTRIES, 1890 TO 1930

The United States produces most of the world's cotton and the variations in production have a dominating influence upon world cotton markets. But production in foreign countries has been gaining. Forty years ago the crop of the United States was twice that of foreign countries outside of China. Now it is only about 50 per cent greater than the production of those countries.

(Fig. 24.) From 1914 to 1920 foreign production declined, but from 1920 to 1925 it rose sharply and since then has held at a high level. A part of the increase in foreign crops after 1920 came from the stimulating effect of the high cotton prices as in Egypt and India, a part was due to cotton production projects, as in Russia and the Sudan, and part was the result of natural economic development, as in China and South America.

Most foreign crops are temporarily reduced by, or their increase is checked following, low prices, but they are not easily eliminated or permanently reduced. Once production is started, cotton is a strong competitor for land; therefore, it is not reasonable to look for a downward trend in foreign cotton production. Temporary reductions may follow low prices, however, and steady, keen competition from American cotton might hold foreign production in check and permit the growth in demand to be met by American

cotton. This would require low, as well as steady, prices. But the slow growth of foreign production is not so serious to the American cotton growers as are rapid changes. Adjustments can be made to gradual changes, but it is almost impossible for farmers to make changes rapidly without sustaining losses. Spinners also have difficulty in making rapid changes. It was the difficulty of adjusting to violent changes that led some groups of foreign spinners to foster cotton growing in other countries. To the extent that the supply is stabilized when drawn from many areas, this affords some benefit as well as more severe competition to the American cotton grower.

SUPPLY IN UNITED STATES

Prior to the World War the cotton crop of the United States rose steadily until in 1914 when the crop totaled 16,135,000 bales, or more than twice the size of the crop of 1895. This increase in production was made on an acreage which was trending upward. (Fig. 25.) Yields for the country as a whole had a very slight upward trend, although this was a composite of a downward trend in Texas and an upward trend in the eastern belt. During the war years the acreage held about constant but yields were lower because of the spread of the boll weevil.

Between 1920 and 1926 the whole cotton-production situation of the United States changed. The boll weevil completed its progress across the Cotton Belt and did its worst damage in 1921, 1922, and 1923. The yield per acre in Georgia in 1923 was little more than one-third that of 1914. (Fig. 26.) A serious reduction in yields also occurred in South Carolina. Cotton production was virtually wiped out in some sections of these States. Prices rose, but this fact was of little benefit to farmers who had lost their crop. Acreage in these States fell materially. (Fig. 27.) The high cotton prices, however, caused acreage to expand in sections that were not seriously affected by the weevil. This expansion took place to the northeast in North Carolina and Virginia, to the north along the Mississippi River, and, most of all, to the west in Texas and Oklahoma. Seven million acres were added in Texas alone, and the total cotton acreage rose nearly 50 per cent. Moreover, the Southeast learned to live with the weevil; yields improved, and the acreage in these States increased somewhat. This general expansion period was checked in 1926 when the South harvested 47,000,000 acres of cotton and obtained the record crop at 18,000,000 bales. The increase in acreage had offset the loss in yields and the South was again producing large crops.

Low yields may make cotton production unprofitable, but the Cotton Belt is so large and varied that high prices are almost certain to be associated with profitable yields in some parts of it.

It is principally through acreage adjustments that the cotton farmer must meet changes in demand and supply conditions. In years when cotton prospects appear unfavorable it is advisable to plant more acres to other crops and grow less cotton. When cotton is the best alternative, then that is the crop to plant. The individual farmer can affect the total cotton acreage but little. In forming his plans, therefore, he must consider probable changes in the total

cotton acreage in the same way that he considers changes in other factors that are beyond his control.

The total cotton acreage responds to price changes more than to any other factor. By the time the bulk of the crop is marketed it

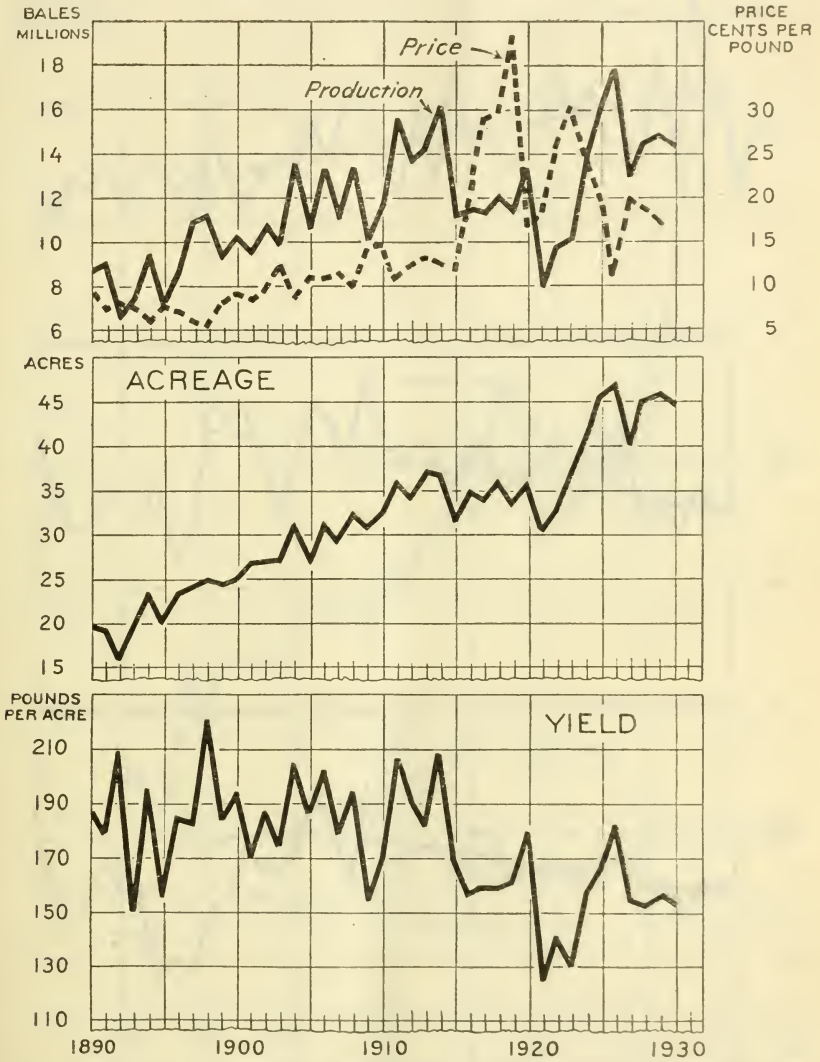


FIGURE 25.—COTTON: PRODUCTION, PRICE, ACREAGE, AND YIELD, 1890–1929

Cotton production was increasing at a rapid rate before the World War. The boll weevil reduced yields, resulting in short crops and higher prices. High prices in turn stimulated acreage expansion in the North and West, while producers in the weevil-infested areas were learning to produce cotton in spite of the weevil. The result has been large crops and low prices during recent years.

is possible to form a fairly definite and reliable conclusion as to the change in acreage for the next year. Following years of profitable prices farmers plant more cotton. Yields have a share in determining profits and in local territories they must be considered in

calculations of the acreage to be planted the next year. High prices caused the expansion of acreages into new areas from 1921 to 1926. Low prices discourage the planting of cotton. Although the aim

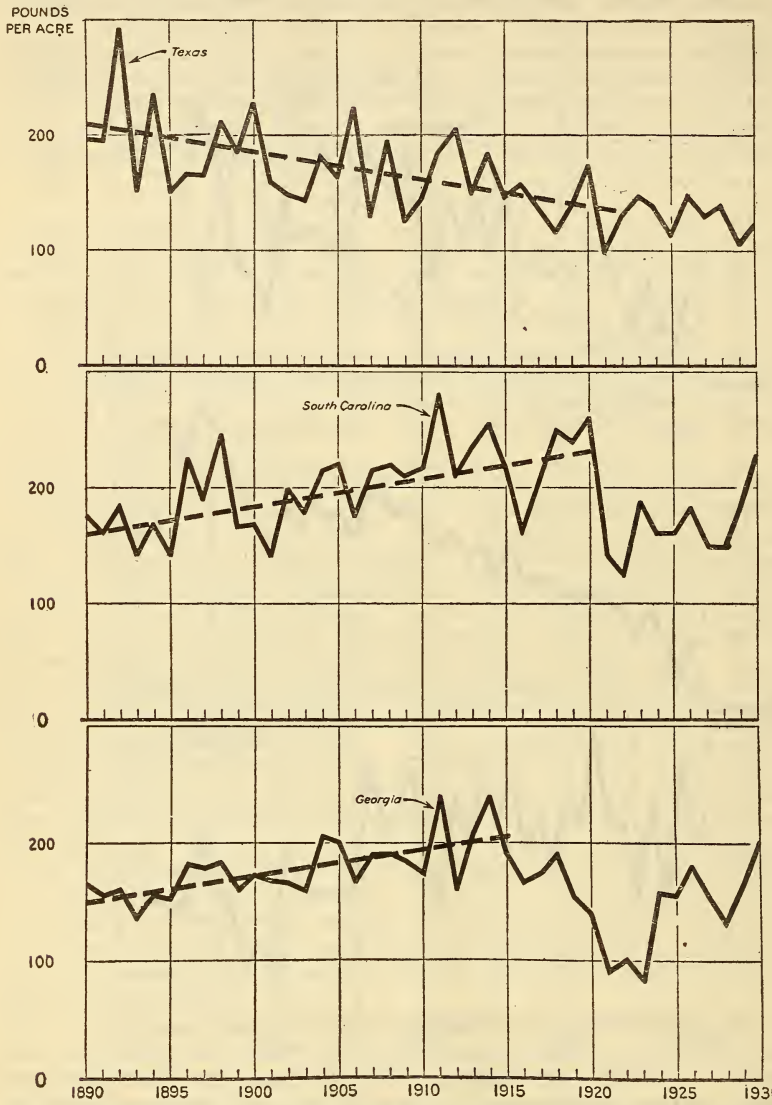


FIGURE 26.—COTTON YIELD PER ACRE IN TEXAS, SOUTH CAROLINA, AND GEORGIA, 1890–1930

Cotton yields in the West have declined as the acreage has expanded into drier areas. Increased use of fertilizers and better varieties increased yields in the East until the boll weevil came. During recent years there has been a partial recovery from the effects of the boll weevil.

is to have farmers make necessary adjustments in acreage before prices decline, most of them continue to make adjustments afterward. The low prices of 1926 caused a reduction in cotton acre-

age in 1927. The acreage increased again in 1928 and in 1929 but the prices received for the 1929 crop caused a slight reduction in acreage in 1930.

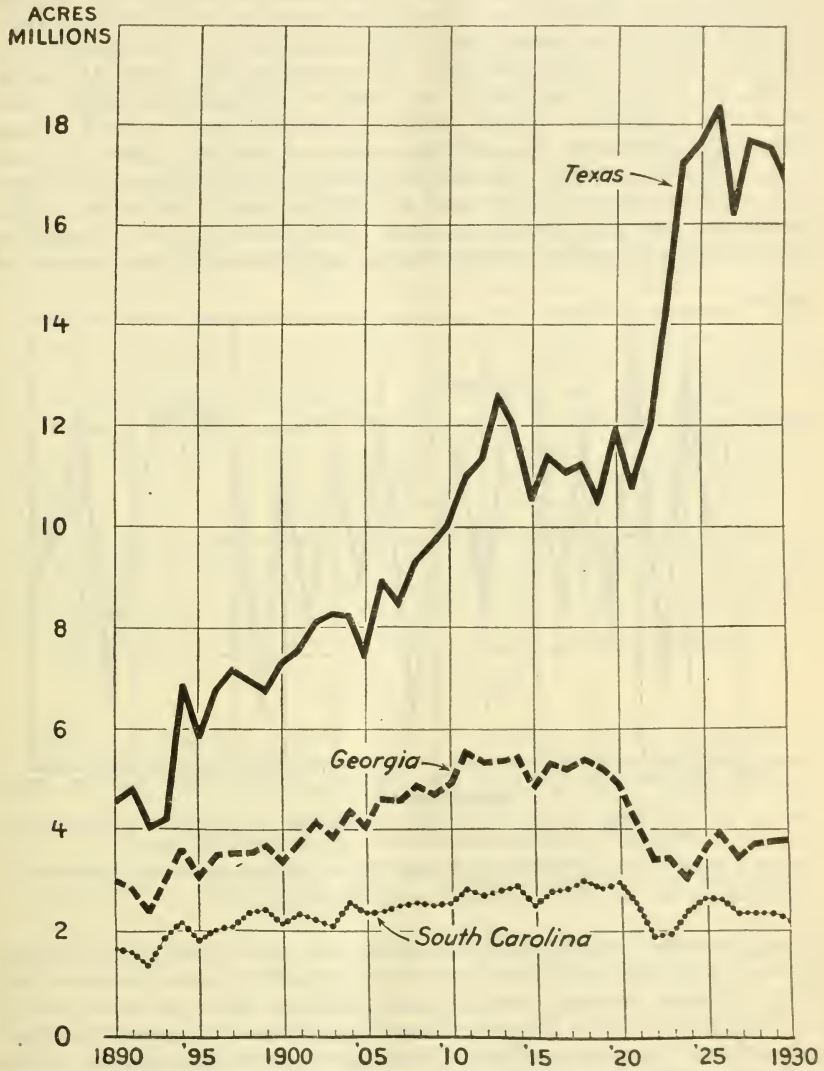


FIGURE 27.—COTTON ACREAGE IN TEXAS, GEORGIA, AND SOUTH CAROLINA, 1890–1930

Cotton acreage was expanding rapidly in Texas before the World War. War conditions together with relatively low prices temporarily checked expansion both in the West and in the East. High prices following the war again stimulated expansion in the West. In the East the first attacks of the boll weevil reduced cotton acreage, but there has been some recovery during recent years.

The behavior of cotton acreage following years of violent change deserves consideration. In the past when cotton acreage has changed very much in one year there has been a tendency for it to change in the opposite direction the following year. Apparently unusual

expansion or contraction requires special efforts which are not put forth the following year. This tendency is strengthened by the fact that prices also tend to change in the opposite direction from acreage and production. The effect has been to prevent stabilization of cotton production. Efforts to reduce cotton acreage to safe proportions may have had some immediate effect, but this has been lost in the next year or two. (Figure 28.) The acreage fell from 31,215,000 in 1904, to 27,110,000 in 1905, but rose to 31,374,000 in 1906. The acreage in 1912 was reduced almost 2,000,000, but in 1913 it rose nearly 3,000,000 acres. In 1926 there were 47,087,000 acres of cotton and in 1927 this acreage was reduced to 40,138,000, but in 1928 there was a recovery to 45,341,000 and in 1929 to 45,981,000 acres. Such changes are costly to cotton growers. Until the practice of making violent swings in cotton acreage can be supplanted by the practice of

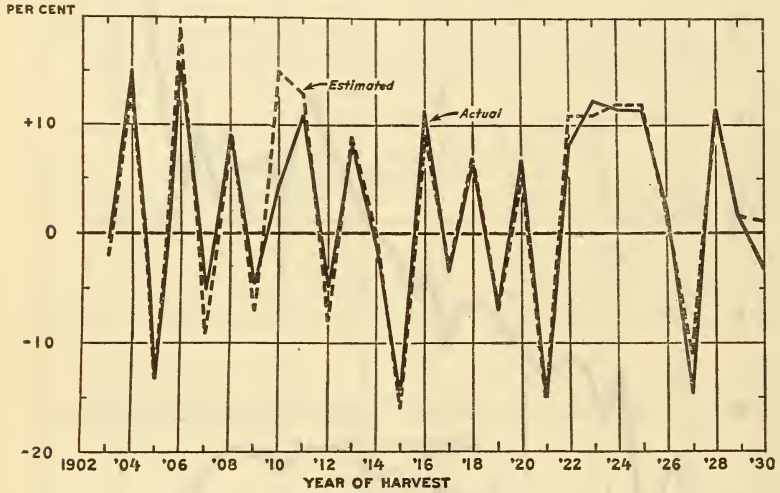


FIGURE 28.—UNITED STATES COTTON ACREAGE CHANGES: ACTUAL AND ESTIMATED, FROM IMPORTANT FACTORS, 1903–1930

Cotton acreage in the United States changes violently from year to year. Extreme reductions have been followed by large increases the next year. A large part of the changes can be forecast from past prices and changes.

making moderate adjustments to changes in price prospects, farmers will need to be especially cautious about planting cotton in years following material acreage reductions. Another effect of these variations is that they have increased the risk element in cotton incomes. No doubt there are many alternative crops that could be grown in the South at a sufficient profit to compete with cotton on the average for a period of years which have been neglected because cotton growers have centered their attentions too closely on the years of high cotton prices.

The year 1926 demonstrated that high yields can be obtained under boll-weevil conditions, although the yield of 182 pounds per acre that year was below the pre-war average. The lowest yield, amounting to 124 pounds per acre, was obtained in 1921. The difference of 58 pounds per acre between the yields of 1921 and 1926 would change the crop by 5,500,000 bales on an acreage of 45,000,000.

The yield of 124 pounds is not only the lowest average ever recorded for this country; when it occurred the weevil was at its worst and in much of the Cotton Belt farmers were totally unprepared to combat it. Poisoning, more effective fertilizing, and new varieties of cotton have made it possible to limit weevil damage. Repetitions of 1921 yields are unlikely. On the other hand the 182-pound yield of 1926 was the highest during the last 16 years. Many conditions are necessary to bring about such extreme yields, and they occur but seldom in combination. These considerations suggest the use of average yields for calculations of the future, and the truth is that the use of the 10-year average yield would have given essentially correct calculations for the last four years. If an average must be used it should be noted that the 10-year average yield of 155 pounds per acre is influenced slightly more by the three lowest yields than by the highest ones. But some additional indications are available as to probable yields. The damage from weevil tends to vary in cycles, so that damage in one year has some significance as a suggestion of damage the next. Conditions in the fall and winter temperatures are significant in that they show the number and development of weevils entering hibernation and suggest weevil emergence. In the extreme West, fall and winter precipitation are important because the crop there must have a goodly supply of soil moisture or adequate rains in the growing season. In the East the quantity of fertilizers used is an important factor in determining yields. Although a large part of the yield variations is due to occurrences during the growing season, enough indications of yields are available at planting time to help farmers in deciding upon their cotton acreage for the season, and, from the individual's point of view, whether it is advisable to plant more cotton or more alternative crops.

SUPPLY IN INDIA

India is the largest cotton producer among foreign countries. It produces about one-third as much cotton as the United States. Reports of production in India are not satisfactory. Not all of the crop goes through commercial channels so it is difficult to get a check on the accuracy of production estimates. Some years more Indian cotton is consumed in mills or exported than would be anticipated from the production estimates. This may be because of error in the estimate or because of the using up of stocks. As an additional indication of the size of the crop, Figure 29 shows both the production as officially estimated and the commercial crop as calculated from exports, consumption, and changes in stocks by the United States Bureau of the Census.

The Indian cotton crop has been increasing slowly. The fact that the commercial crop has been increasing more rapidly than the production estimates probably means that a larger part of the crop enters commercial channels now than before the World War.

Variations in the size of the Indian crop from year to year are fairly large proportionately, but do not affect the world total supply as much as do variations of equal proportion in the larger American crop. India plants cotton later in the year and markets the bulk of its crop several months later than the United States. Price de-

clines in 1920 and 1926 reduced the Indian crops of those years whereas the American crop was not reduced until in 1921 and 1927. The low prices of 1914 caused both crops to be reduced in 1915.

Much attention has been given to the probable extent of competition from Indian cotton in the future. Cotton acreage there has been expanding slowly, and probably it can be pushed farther. Yields also have improved from 76 pounds per acre before the war to about 90 pounds since the war. It would seem that material further increases could be made in yields. Finally, India has low wage scales.

But the situation is not one-sided. Unless some unusual impetus is given to cotton planting, expansion in India's cotton acreage is likely to come slowly. It is very improbable that the fundamental changes in production practices, which are necessary to increase a country's average yield, can be brought about with sufficient rapidity

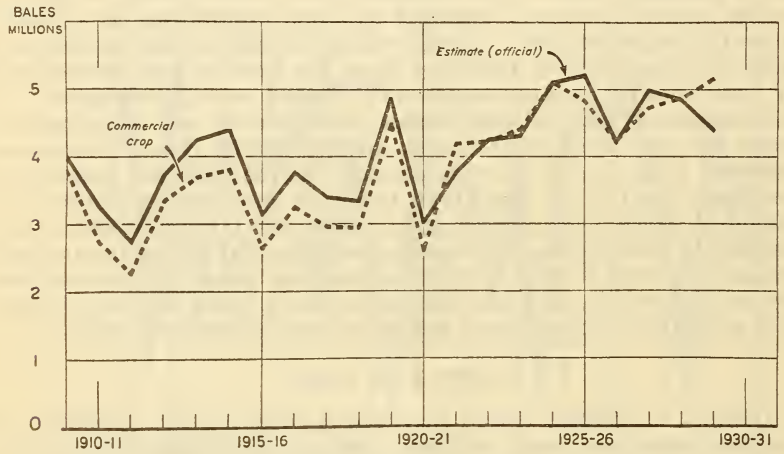


FIGURE 29.—INDIA: COTTON PRODUCTION, 1909–10 TO 1929–30

India is the largest cotton producer outside the United States. India's cotton crop is gradually increasing, but prices since 1924 have held the increase in check

in India to make it a disturbing factor in the world cotton situation in the near future. Nor do low wage scales make India stand forth as a necessary victor in world cotton competition. General low-wage scales are largely a reflection of labor's inefficiency in production. With production practices requiring large amounts of hand labor, yields of 80 to 95 pounds per acre are not especially profitable when the product is sold at the low price brought by Indian cotton.

Indian cotton production reacts to price changes very much as does that of the United States. The years of high prices from 1921 to 1923 caused an expansion in India just as they did in the United States and several other countries. The low prices that checked that expansion in the United States also checked it in India.

Although cotton production in India can reasonably be expected to increase in the future as it has in the past, that country is not especially equipped to expand production in the face of low prices. Probably the most important aspect of the competition between

Indian and American cotton is concerned with the shift in textile manufacturing from Europe to the Orient. In Europe, American cotton has always had the advantage in competition. Oriental mills use more Indian cotton. If the American crop is to maintain its position in world trade it must follow the cotton spindles, and to do this it must compete in price as well as quality.

SUPPLY IN CHINA

China is the second largest foreign cotton producer. So much of the Chinese crop is consumed in homes in the interior of the country without passing through commercial channels that little is known of the total Chinese crop. In former years estimates of its size varied by millions of bales depending upon the agency making the estimate. During recent years the Chinese Mill Owner's Associa-

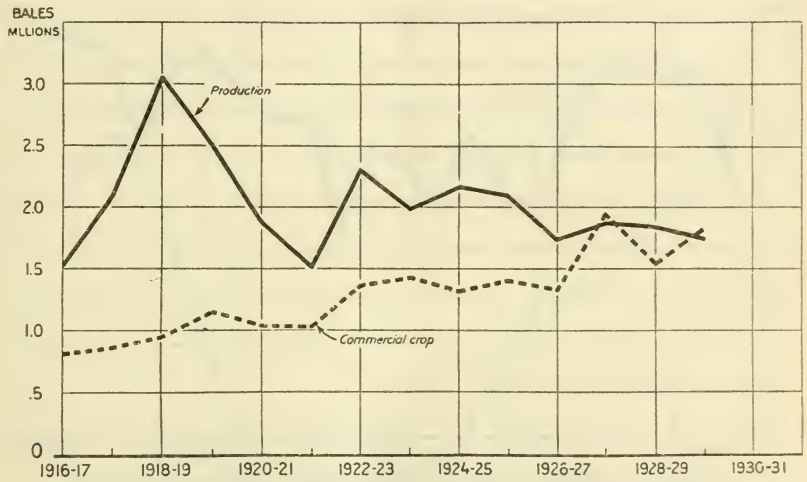


FIGURE 30.—CHINA: COTTON PRODUCTION, 1916–17 TO 1929–30

The commercial cotton crop of China is gradually increasing. Much of the crop is manufactured in homes without coming to central markets, so little is known of the total size of the Chinese crop.

tion has been making estimates of the Chinese crop which deserve consideration. The United States Bureau of the Census also calculates a commercial crop for China. (Fig. 30.) The estimates of production indicate that the Chinese cotton crop is not so large as it was a few years ago. But it is possible that the estimates have changed so as to include less of the crop used domestically. Calculations of the commercial crop show a continued upward trend. This may reflect an encroachment of commercial spinning mills upon the home-spinning industry rather than a change in the size of the crop. The Chinese crop is the principal source of supply for Chinese mills, and forms an important part of the supply for Japanese mills. The cotton crop must compete with food and other crops for land, however, and following years of large crops and low cotton prices in the important producing sections, growers have turned from cotton to other crops.

SUPPLY IN EGYPT

Egypt produces the third largest of the foreign cotton crops. For the last five years the Egyptian crop has averaged a little over 1,500,000 bales, or about 10 per cent as much as the American crop. Essentially all of the Egyptian crop is consumed in other countries, so Egypt is the third largest cotton-exporting country. Egypt's exports amount to roughly one-fifth those of the United States or one-half those of India. The fact that the Egyptian crop is practically all long-staple cotton gives it a special prominence in the world cotton trade.

The long-time trend of production in Egypt is very slowly upward Egyptian production reached a high level in the period 1910 to 1914. Low prices and the beginning of the World War caused production to be reduced and it was held in check throughout the

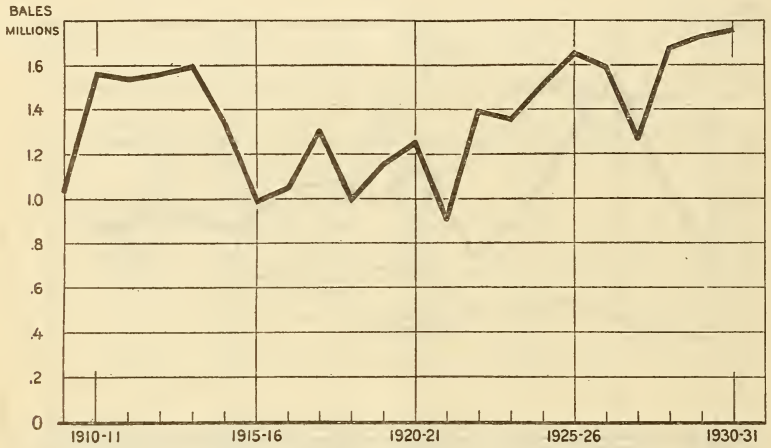


FIGURE 31.—EGYPT: COTTON PRODUCTION, 1909–10 TO 1929–30

Egyptian cotton production is increasing very slowly. Further increases may occur, but the available land is limited and low cotton prices may cause a shift to other crops.

war years. The depression of 1920 caused another contraction in production; then the high prices engendered by short American crops caused a marked increase. As prices fell the Egyptian Government passed laws limiting cotton acreage. There was a significant decrease in the Egyptian crop in 1927 but the last two crops have been the largest on record, and the Egyptian cotton acreage was further increased in 1930. (Fig. 31.) Large quantities of cotton are being held in Egypt as a result of attempts to stabilize prices, and it appears that similar activities will be continued this season.

There appear to be fairly definite limits to acreage expansion in Egypt, but apparently these limits have not quite been reached so far. Although expansion in Egypt would probably not result in a serious increase in the total world production, it could be important in the market for long-staple cotton. However, the Egyptian production has been curtailed in the past, following periods of low

prices, so that material expansion is hardly to be anticipated until prices become more favorable than they are now.

SUPPLY IN RUSSIA

Rapid increases in the Russian cotton crop within recent years have brought it strikingly before the public eye. (Fig. 32.) Under the new system of government and a changed economic system it is difficult to draw conclusions as to the possible limits of expansion. Prior to the World War Russian production was expanding and a crop of 1,500,000 bales was reported in 1915. Thereafter the Russian crop decreased, and in the early years of the Soviet régime it fell rapidly. In 1921 the Russian crop amounted to only 43,100 bales. Then it started upward again. In 1929 the crop was reported to equal 1,351,000 bales. A very large increase in acreage

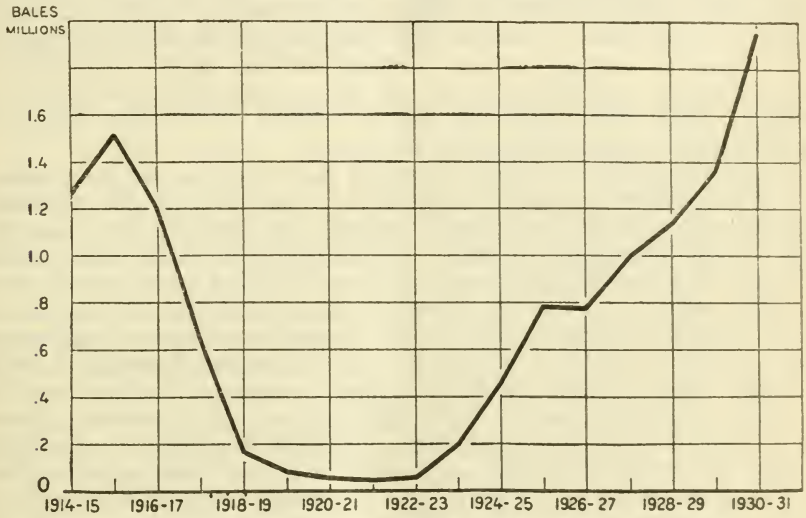


FIGURE 32.—RUSSIA: COTTON PRODUCTION, 1914–15 TO 1929–30

Russian cotton production surpassed to its pre-war peak and the Soviet Government plans to increase it considerably more. The Russian crop of 1929 was one-tenth as large as that of the United States, or about equal to that of Egypt or the commercial crop of China.

is reported for 1930 and the 1930 crop is forecast at about 1,950,000 bales. If this is approximately correct, as it appears to be, it will make Russia the second largest foreign cotton producer. During past years Russia has imported considerable quantities of cotton, but at present the Soviet Government is trying hard to supply its cotton requirements from its own production, and low exchange rates and small incomes from abroad are making this a virtual necessity. The "5-year plan" of the Soviets calls for material increases in both production and consumption of cotton. A considerable degree of success has been reported in carrying out the programs, and Russia's imports have been reduced.

Most of the Russian cotton crop is grown in Russian central Asia (Turkestan) under irrigation. Prior to the revolution, the total irrigated area in this region was estimated at 6,182,000 acres by the former provincial statistical committees, and at 6,749,000

acres by the irrigation administration. Because of climatic and other conditions this land could not all have been used for cotton. On the other hand the total area of land suitable for cotton and which might have been irrigated, in this region, was estimated by various authorities at from 13,000,000 to 16,000,000 acres, according to A. P. Demidov.[1] Obviously it would be impossible to devote all the suitable land to cotton. In 1929 the total irrigated area totaled 8,640,000 acres, or from 2,000,000 to 2,500,000 acres above that before the revolution. The 1929 cotton area in this region was estimated 2,208,000 acres, or 26 per cent of the land then under irrigation.[2]

A less important cotton-producing section is located in Transcaucasia. There, also, cotton is grown under irrigation. Although it is not known to what extent these irrigated lands are adaptable to cotton production, about 2,000,000 acres were reported by Soviet authorities to be irrigated in 1929, of which cotton occupied 328,000 acres, or 16 per cent. It is also reported that the Soviet Government is planning to develop cotton-growing sections in the North Caucasus, Crimea, and Volga areas. It has not yet been demonstrated, however, that cotton growing can be carried on in these areas in more than an experimental sort of way.

The two principal methods by which the Soviet Government plans to expand cotton acreage in central Asia are through the displacement of other crops, particularly cereals, and through the construction of new irrigation projects. To facilitate the shift from cereals to cotton the Turkestan-Siberian railroad is being constructed, so as to make supplies of cheap Siberian wheat available to the cotton areas. Another potent factor in the extension of cotton cultivation is the tractor. On the one hand its use relieves the shortage of draft animals, which is acute among the cotton growers of Turkestan. On the other hand the use of mechanical power will necessitate fewer acres being devoted to feed grains. In order to utilize the available supply of tractors efficiently, a number of them, together with other improved machinery, are operated by a single organization under a single direction in what is called a "machinery tractor station." About 15 such stations were organized in the cotton-growing regions of central Asia in 1930 and 4 were organized in Transcaucasia, according to Iu. Gololobov.[3] It was planned that 443,000 acres of cotton would be planted by these organizations in 1930, but the official publication, Economic Life, reports that this plan was exceeded by almost 10 per cent, so that nearly a half million acres of cotton were planted in Soviet Russia in 1930 with the aid of tractors.

So far the expansion of soviet cotton production has been largely a recovery to pre-war levels. Whether expansion can be continued as rapidly beyond these limits is difficult to determine. With the Government taking over large tracts of land and operating them under official direction and with production on individually operated farms being directed by means of premiums and regulation, great

[1] DEMIDOV, A. P. ECONOMIC ESSAYS OF THE COTTON-GROWING TRADE AND INDUSTRY OF TURKESTAN. Library of the Cotton Business, Book 3, p. 11. 1926.
[2] Controlling figures of the National Economy of the U. S. S. R. for 1929–30, p. 560.
[3] Russian periodical called (translated) On the Agrarian Front, No. 6, p. 122. 1930.

changes can be anticipated. There appear to be sufficient areas of land under irrigation to care for a material further expansion of cotton acreage if that is desired. Whether yields will be satisfactory on the new areas is not known.

Until more definite information is available it may be well for American cotton growers to proceed on the assumption that Russian production will expand enough to satisfy Russia's consumption requirements. This development would eliminate Russian imports of American cotton which have averaged a little under 300,000 bales for the last seven years, and would leave the Asiatic cotton formerly taken by Russia to be sold on other markets. Most important of all, this development would prevent American cotton from benefiting from future increases in Russian cotton consumption. Reports have been received of Russian cotton having been sold on European markets. Small sales may have been made but developments to date do not suggest that large exports will occur as a regular matter even though sporadic sales may take place because of temporary supply situations or economic conditions.

SUPPLY IN OTHER FOREIGN COTTON-PRODUCING COUNTRIES

The 51 other foreign countries that report cotton production together produce a little over 2,000,000 bales. The eight most important of these, in order of their production in 1928-29 are Brazil, Mexico, Peru, Argentina, Uganda, Chosen, Anglo-Egyptian Sudan, and Persia. In that crop year the Brazilian crop amounted to 553,000 bales and the Persian crop, 121,000 bales. Since these 51 small crops are so widely disbursed, their total is influenced only slightly by conditions affecting annual variations in yields. Variations in their total production are small from year to year, therefore, and follow extreme economic changes affecting all countries, such as the low cotton prices of 1914, 1920, and 1926 which induced lower productions. The trend of production in these countries is upward, on the whole; the total rose from 1,000,000 bales in 1910 to slightly over 2,000,000 bales in 1928-29. As in the case of the Indian and Egyptian crops, these minor crops declined during the war years and then recovered. In 1921 they fell in response to the world-wide price deflation, but the subsequent high cotton prices engendered by the small production in the United States caused these minor crops to increase steadily until 1926-27. Their total increase from 1921 to 1926 amounted to nearly 1,000,000 bales. In 1928 their total was again at the 1926 level. Their general increases are so largely accompaniments of the economic development in the respective countries that continued gradual increases may be expected. Nevertheless their greatest development came in response to the cotton prices prevailing from 1921 to 1925, and reductions have occurred following very low prices. Although permanent reductions in the total of these crops are unlikely, previous records do not indicate that expansions are likely to take place in the face of low prices.

PRICES OF AMERICAN COTTON

Cotton prices have several types of movement: Short-time fluctuations, seasonal variations, cyclical movements, and long-time trends.

The short-time movements frequently receive an unwarranted degree of attention. From the producer's point of view the longer movements are usually of greater importance. Speculators pay more attention to the short-time fluctuations.

The long-time trends of cotton prices are closely associated with the long-time trends in general commodity price levels or outstanding developments in production such as followed the invention of the cotton gin. (Fig. 33.) Following the War of 1812 both cotton prices and the general price level fell sharply until 1820, then they declined gradually until 1830. After a recovery declines again set in, but from 1843 to 1861 the general price level had no marked trend, whereas cotton prices moved upward. After the Civil War cotton prices fell sharply until 1867, then they followed the general price level downward until 1897. From 1897 until the World War the trend of both was upward. In 1920 there was again a sharp drop in

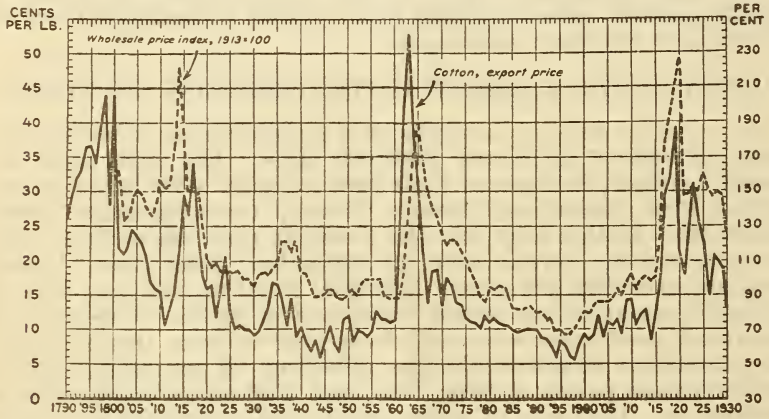


FIGURE 33.—COTTON PRICE PER POUND, 1790–1929

Cotton prices have long-time trends lasting over periods of years. These trends are associated with similar long-time changes in general commodity price levels. Following the War of 1812, price levels fell sharply at first, then more gradually. Following the high point of the Civil War, price levels fell sharply until 1879, then fell gradually until 1897, when an upward trend began. Following the World War, price levels dropped precipitously, then rose again until 1925, but have been declining since.

cotton prices and in the general price level. Cotton prices recovered for a few years because of short crops, but the recovery was soon lost. Their recent declines due to the world-wide depression have carried them below the average for the years 1910 to 1914. After the drop in 1920 general price levels steadied and made some recovery until 1925 but then turned downward again. These long-time trends in price levels are especially important to farm owners. Investments in land and durable improvements should be made with special attention to low-cost production when price levels are declining.

Supplies of American cotton for the last few seasons prior to 1930 have not been excessive in comparison with world consumption in recent years. The supply for the 1929–30 season was the lowest in five years. The crop of 14,828,000 bales compares with the previous season's consumption of 15,076,000 bales. With the fall in demand, consumption for the season fell to 13,023,000 bales. Cotton did not

disappear into consuming channels so rapidly as during the previous few years, foreign mills reduced their stocks, and exports fell off 1,353,000 bales. As a result, the carry-over in this country at the beginning of the 1930–31 season was the largest since 1921. A part of this increase was offset by lower stocks abroad, but still the world carry-over of American cotton was increased by about 1,800,000 bales. Production in 1930 is about 400,000 bales below 1929. The world total supply of American cotton for the 1930–31 season is therefore about 1,400,000 bales larger than for the 1929–30 season. This supply is nearly as large as that of 1927–28 when New Orleans prices averaged 20 cents a pound, or the equivalent of about 18 cents a pound at the present level of commodity prices. The lower level of cotton prices now prevailing is due largely to the general world-wide business depression. (Fig. 34.)

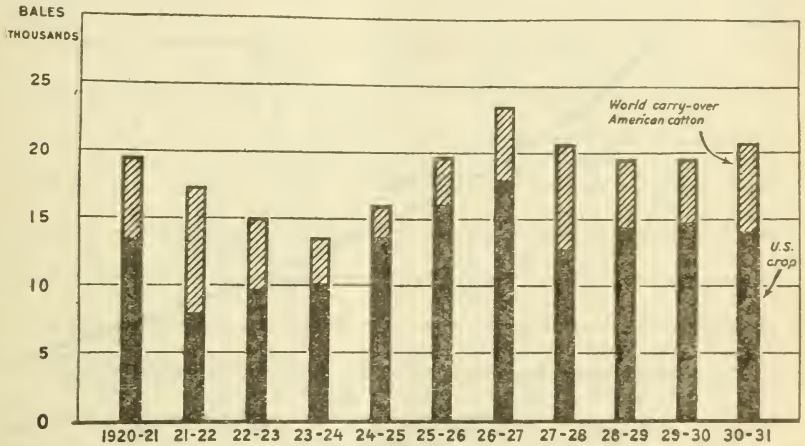


FIGURE 34.—SUPPLY OF AMERICAN COTTON, UNITED STATES CROP AND WORLD CARRY-OVER, 1920–21 TO 1930–31

World supplies of American cotton became very low in 1922 and 1923, but as production increased supplies rose to a record level of 23,500,000 bales in 1926. Supplies were successively lower in each of the last three years, but this year they are larger as a result of an increased carry-over. The present supply of about 20,700,000 bales is about the same as that of 1927–28 and was materially exceeded only by that of 1926–27.

Supplies of cotton have a strong influence on prices. The average influence can be determined by comparing prices and supplies for different seasons. (Fig. 35.) Variations from the usual relationship are to be attributed to changes in demand. For the last few years a comparison of supplies and prices of American cotton shows that according to the most usual relationship prices fell about 1¼ cents per pound for every million bales that were added to the supply and they rose a corresponding amount for every million-bale reduction in supply. Changes in demand, however, have a great influence upon the supply-price relationship.

The severe world-wide depression and accompanying deflation of 1920–21 caused demand to be especially low that year. Recovery in the United States was only gradual for the average of all industries, and in some European countries it was very slow but the demand for cotton rose considerably in 1921–22. By 1923–24 demand had reached a rather high level, and with short supplies prices were

very high. On the whole, demand was rather stable from 1923 to 1926. In 1927, however, conditions in Germany were the most satisfactory they have been since the World War, and with conditions fairly good in other countries demand was stronger than usual. Central Europe became depressed in 1928–29 and demand slipped downward. In 1929–30 the depression spread rapidly; demand fell throughout the season and averaged the lowest since 1922–23. During the first three months of the present season demand has been as low as in 1920–21.

STAPLE LENGTH OF AMERICAN COTTON

The wide range of staple lengths of cotton give rise to a complicated set of supply and demand conditions for the different groups

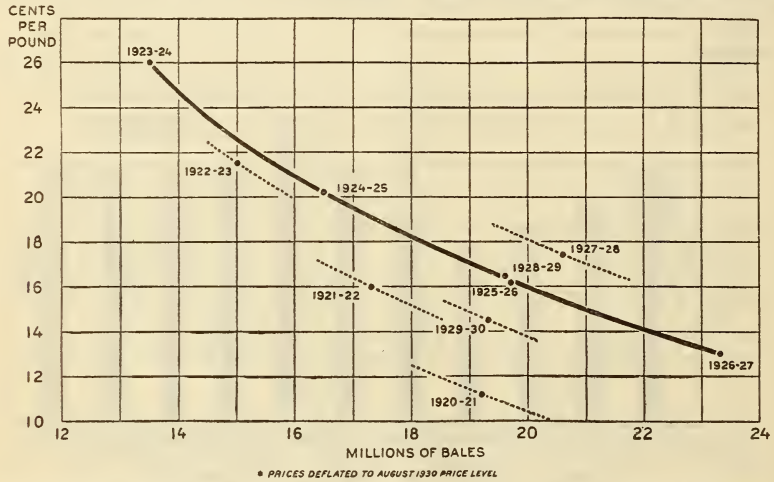


FIGURE 35.—RELATION BETWEEN PRICES AND SUPPLIES OF AMERICAN COTTON

By itself, an increase of 1,000,000 bales in the supply of American cotton lowers the price a little over 1 cent per pound. After eliminating changes due to general price levels, comparisons between supplies and average prices show the effects of changes in demand. From 1920–21 to 1923–24 demand improved materially and this, as well as the lower supplies, raised prices. During 1927–28 demand was especially strong, but during the last two years depressions have lowered demand.

of staples. There is a range within which cotton having one staple length can be substituted for that having another length in the manufacture of the bulk of cotton goods. This keeps prices of the various cottons fairly well together in their major trends, but price differentials between cotton of various staple lengths are not constant. These differentials are usually calculated as premiums or discounts from 7/8-inch cotton. Long cottons uniformly sell for more than short ones, but the premiums are not constant. For example, premiums on 1¼-inch cotton at Memphis varied from 2 cents (200 points) per pound in 1924 to nearly 15 cents (1,500 points) in 1925. Some of the especially long cottons constitute almost distinct commodities. In the past only a small portion of the premiums paid in the central markets were returned to growers. With local marketing organizations purchasing on the basis of staple length, farm-

ers will need to give attention to staple premiums and discounts as well as the level of basic prices.

Staple premiums on long cotton fell to unusually low levels in 1923–24. (Fig. 36.) Following this low point, premiums on $1\frac{1}{16}$-inch to $1\frac{1}{4}$-inch cottons, inclusive, rose sharply to a peak in the spring of 1925, and then started a downward trend which lasted until February, 1927, on $1\frac{1}{16}$-inch cotton, until May, 1928, on $1\frac{1}{4}$-inch cotton, and until December, 1928, on $1\frac{1}{8}$-inch and $1\frac{3}{16}$-inch cotton. Premiums then rose again until the summer months of 1929 when there was a sharp decline. Following this, an upward trend developed for $1\frac{1}{4}$-inch cotton and a downward trend set in for the shorter cottons in this group. Premiums on $\frac{15}{16}$-inch and 1-inch cottons rose gradually from the low point of the 1923–24 season until the middle of the 1925–26 season, then held fairly steady until

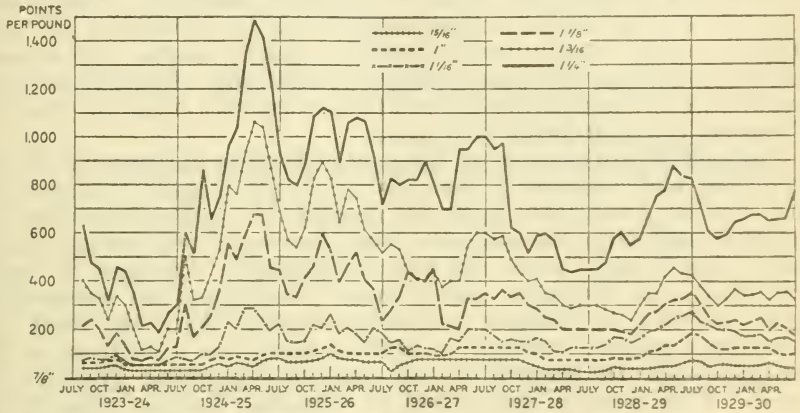


FIGURE 36.—APPROXIMATE STAPLE PREMIUMS AT MEMPHIS FOR MIDDLING GRADE BASED ON MIDDLING $\frac{7}{8}$-INCH PREMIUMS IN POINTS OR HUNDREDTHS OF A CENT PER POUND

Premiums paid for cotton of over $\frac{7}{8}$-inch staple length are affected by changes in the demand and supply conditions for these staples. The trends of premiums on staples of 1-inch to $1\frac{1}{4}$-inch were downward from the high point reached during the period 1925 to 1928, but on $\frac{15}{16}$-inch and 1-inch cottons they gradually advanced from 1923 through 1927. Premiums on all these staples advanced during the latter part of the 1928–29 season and in July, 1929, 1-inch cotton was the highest in the 6-year period. In 1930 some premiums declined, but not proportionately to the declines in prices of $\frac{7}{8}$-inch cotton.

late 1927, when they fell. From January to July, 1929, premiums for 1-inch cotton rose, then declined, but premiums for $\frac{15}{16}$-inch cotton rose and fell only slightly in the summer of 1929 and were rather steady for the remainder of the 1929–30 season.

The grouping of staple premiums have changed significantly since 1923. Up to the beginning of the 1928–29 season premiums for $\frac{15}{16}$-inch and 1-inch cottons tended to move together, whereas the trends of premiums for $1\frac{1}{16}$-inch to $1\frac{1}{4}$-inch cottons were rather similar, with $1\frac{1}{16}$-inch cotton having a trend somewhat intermediate between the two groups from the beginning of 1927. During the last two seasons $1\frac{1}{4}$-inch cotton has had an independent strength which caused the spread between it and other staples to widen and the trend from August, 1929, for the rest of the season was upward. During the 1928–29 season the spread between $\frac{15}{16}$-inch and 1-inch cotton widened. For the 1929–30 season premiums

on $\frac{15}{16}$-inch cotton were about steady, premiums on cottons of 1-inch to 1⅛-inch staples were close together and trended downward, whereas premiums on 1¼-inch cotton trended upward and premiums on $1\frac{1}{16}$-inch cotton had no definite trend after August.

PRODUCTION, DISTRIBUTION, AND CARRY-OVER OF AMERICAN COTTON

More of the American cotton crop falls into the ⅞-inch staple length class than into any other class. This is the reason that prices of ⅞-inch cotton are so significant. (Fig. 37.) The proportions of the cotton crop falling into the various staple length classes, however, differs from year to year. In comparison with the crop of 1928, more of the 1929 crop had a staple length of thirteen-sixteenths of an inch and under, less of it was of ⅞-inch and $\frac{15}{16}$-inch staple, and more of it again was 1-inch to 1⅛-inch, inclusive. Production of $1\frac{3}{16}$-inch and longer cotton totaled less in 1929 than in 1928. There are many reasons for differences in staple length, such as seed, cultural practices, soils, and climatic conditions. Drought in 1929 was apparently one of the causes of the relatively larger production of especially short cotton that year.

The general appearance of the curve showing disappearance into exporting and consuming channels by staple lengths is similar to that showing production by staple lengths. Disappearance does not parallel production in any one year, however, and disappearance varies significantly from one year to another. Changes in staple premiums and discounts and demand conditions are reflected in these year-to-year changes in disappearance. With the total disappearance greatly reduced in 1929–30 there was a decrease in the disappearance in staples of all lengths excepting $\frac{13}{16}$-inch and under. This class of cotton sold at a greater discount than in the previous year and with consumer buying power reduced larger quantities disappeared. This development in American cotton parallels the increase in consumption of Indian cotton in Europe.

The carry over in 1930 was larger than in 1929 for all classes of staples except the 1¼-inch class.

DOMESTIC CONSUMPTION OF SOME LONG-STAPLE COTTONS

The United States consumes considerable quantities of long-staple cottons of foreign as well as domestic origin. (Fig. 38.) By far the largest quantities of foreign cottons consumed in this country are Egyptian. In fact, the United States is the second largest consumer of Egyptian cotton. Prior to the war sea-island cotton formed a large portion of the long-staple cotton consumed in this country. When the boll weevil reached the East where sea-island cotton was grown, the domestic production of this cotton came nearly to an end. The loss of sea-island cotton was met in part by the newly developed Pima or American-Egyptian cotton, and in part by Peruvian cotton, but most of the loss appears to have been met by larger imports of Egyptian cotton. The trend of consumption of Egyptian cotton has been more clearly upward than the trend in total consumption of these several growths. Just after the war the tire industry provided a very large demand for long-staple cotton. After the 1920 depression large quantities of these cottons were con-

sumed. The consumption of Pima cotton declined shortly thereafter, however, and the imports of Peruvian cotton became small. The consumption of all these cottons fell in 1929–30. The important

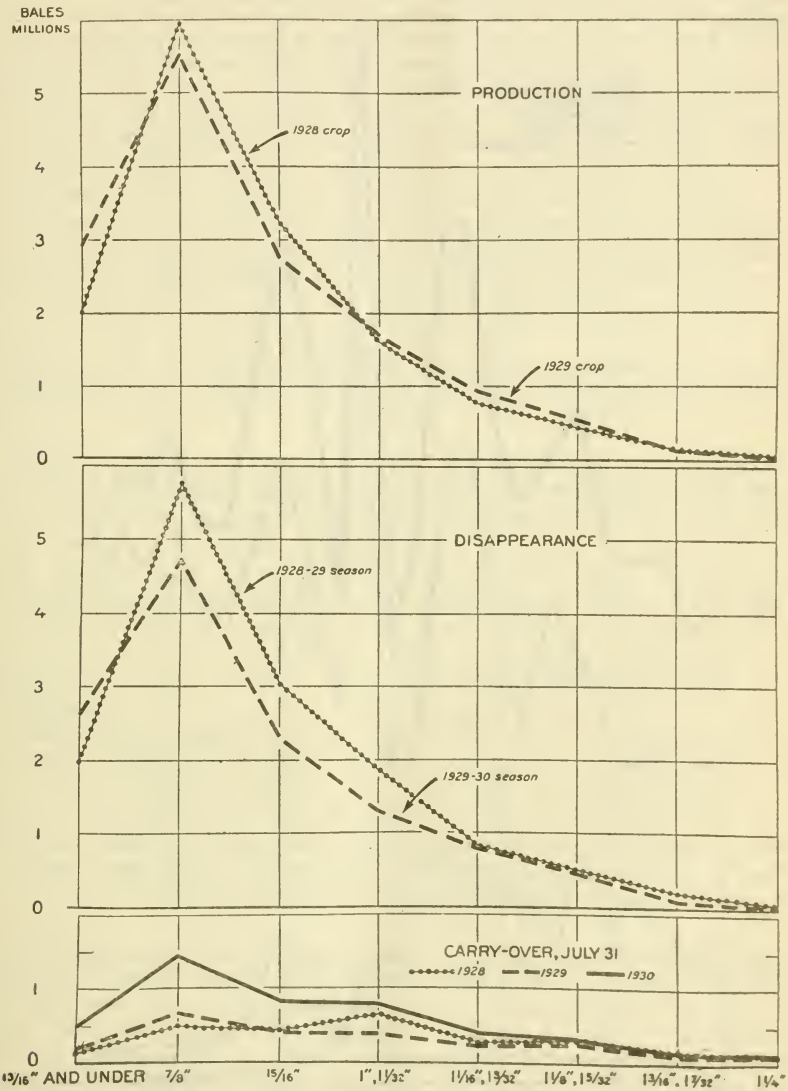


FIGURE 37.—COTTON, AMERICAN: PRODUCTION, DISAPPEARANCE, AND CARRY-OVER BY STAPLE LENGTHS

There is a wide range in the staple lengths in the American crop, but more of the cotton is seven-eighths of an inch than any other length. The distribution of the crop by staple lengths differs from year to year. Disappearance into consuming and exporting channels depends upon premiums and discounts, and conditions affecting demand by staple lengths. (The chart is based on pleminary figures.)

problem for the future is the effect of the 7-cent tariff on cotton having a staple length of 1⅛ inches and over. It is too soon to determine that effects have not yet been indicated definitely, but imports of Egypitan cotton have fallen, and it seems reasonable

FIGURE 38.—COTTON: UNITED STATES MILL CONSUMPTION OF SPECIFIED LONG-STAPLE GROWTHS BY CROP YEARS, 1906–1929

The United States has been an importer of long-staple cotton. The decline in production of sea-island cotton increased the consumption of Egyptian and Peruvian cottons. The consumption of these cottons and American-Egyptian cotton was high from 1921 to 1923, but has been lower since then. New developments in the making of tires have been one of the factors of importance in the demand for these cottons.

that Pima and upland long-staple cotton will be substituted for a large part of the Egyptian and Peruvian cottons formerly imported.

STAPLE LENGTH OF FOREIGN COTTON

For certain purposes it may be advantageous to treat foreign cottons in three broad groups, according as the length of the staple falls into the groups—less than 7/8-inch, 7/8 to 1 3/32, and 1 1/8-inch and over. Foreign cottons have not as yet been completely classified according to one universal standard. In using information characterizing foreign cottons it must be kept in mind that this information comes from a number of sources and is based on somewhat different concepts of staple length. Some cottons are characterized in accordance with Liverpool interpretations of staple length. Samples of others have been classed by the Division of Cotton Marketing. It seems advisable, therefore, to avoid an overrefined grouping. As more complete and comparable information becomes available it probably will be found necessary to make some changes in these classifications. In the meantime, however, it seems desirable to make use of information now available for a broad classification of foreign cottons.

Foreign cottons of staple lengths ranging from seven-eighths of an inch to 1 3/32 inches are the most important competitors of American cotton, as more than 75 per cent of the American crop falls within that range. Foreign countries now produce, roughly, 4,000,000 bales of 478 pounds of cotton within this staple range. This amounts to about 35 per cent of the total foreign production. (Table 1.) The most important increases in production of foreign medium-staple cotton have occurred in India and Russia, with smaller increases in Brazil, Argentina, Peru, Paraguay, Union of South Africa, and Chosen.

Efforts have been made by the Indian Government to improve the staple length of Indian cotton. Production of both the longer and shorter Indian cottons has increased, but production of the longer cottons has increased more rapidly. Between the period 1915–1918 and the crop year 1925–26, production of staples described as 7/8-inch and above (Liverpool interpretations) increased about 138 per cent, while the production of shorter staples increased only about 20 per cent. (Table 2.) Since that time there has been a decline in production of longer staples and the crop of 1929–30 showed an increase of only about 60 per cent over the 1915–1918 period for staples described as 7/8-inch and above. The average of the 1925–26 to 1929–30 Indian crops may be divided roughly into 2,900,000 bales of 478 pounds net, under seven-eighths of an inch and 1,830,000 bales seven-eighths of an inch to 1 3/32 inches. (Liverpool interpretations.)

The Russian crop, which has been increasing rapidly throughout recent years, is classed as medium-staple cotton.

About 40 per cent of the cotton produced in foreign countries, or about 4,700,000 bales, is below seven-eighths of an inch in staple length. Most of the short-staple cotton is produced in India, China, Turkey, and Persia. These cottons vary widely in character. Much of the cotton produced in China, Turkey, and Persia is rough and

harsh. The bulk of this cotton comes directly or indirectly in competition with American cotton of the shortest staple lengths.

Long-staple cotton, 1⅛ inches and longer, is produced in many countries, the principal foreign sources being Egypt, Uganda, Anglo-Egyptian Sudan, Peru, Brazil, and Chosen. This long-staple cotton competes with American Pima and upland long staples. Foreign countries produce about three times as much long-staple cotton as the United States.

PRICES OF FACTORS USED IN COTTON PRODUCTION

Prices of the factors used in producing cotton move, on the whole, with the general level of commodity prices. Prior to the World War they rose gradually, then, in 1917, 1918, 1919, and early 1920 there were sharp rises which carried the weighted-average index of

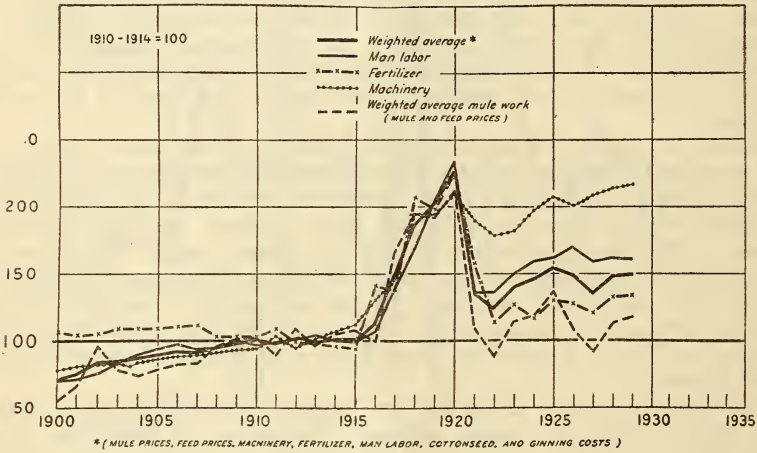


FIGURE 39.—INDEXES OF MAN LABOR, MULE WORK, MACHINERY, AND FERTILIZER COST FACTORS IN COTTON PRODUCTION

The cost of factors entering into cotton production were increasing before the World War, moved upward at a rapid rate during the war, but declined much less than cotton prices after the war. The costs of horse labor and fertilizers have declined, but machinery and wages have held to a fairly high level.

cost factors to about 225 per cent of the 1910–1914 average. With the general price deflation and reduction in wage levels the average index of cost factors dropped to about 125 per cent of pre-war. Thereafter, the rise in wages resulting from the industrial prosperity, the continued high machinery and ginning costs, and the recoveries in feed and seed prices, caused the average index of cotton-cost factors to rise to around 150 by 1925, and, except for temporary reduction in 1927, it has remained at about that level through 1929. (Figs. 39 and 40.)

Each of the factors used in cotton production is subject to different sets of price influences and in terms of their 1910–1914 averages they now differ greatly. Costs of man labor on the farm are influenced materially by the competition that industry offers for workers. When industry is prosperous labor migrates from rural to urban centers, and cotton growers are forced to bid more for tenants

and to pay higher wages. With the coming of the present depression in industry more labor became available in the country, and with prices of farm products also low farmers have not been in a position to pay high wages either. The result was that cotton-picking costs in the fall of 1930 were the lowest in a number of years. Rates of farm wages are not likely to rise until industry offers employment to the surplus labor. Tractors have displaced horses and mules so rapidly during the last few years that mule prices have fallen to levels about equal to those of 1904 and 1905. These low prices have discouraged breeding, but as yet the supply has been ample even at the low prices. Feed prices, the other important element in mule-work costs, vary with the general hay and grain situations, but are also influenced by supplies of locally grown feedstuffs and local demands. Following the low cotton prices and good crops of 1926 feed prices fell. In 1930 the income from cotton was low, but feed supplies were seriously reduced by the drought.

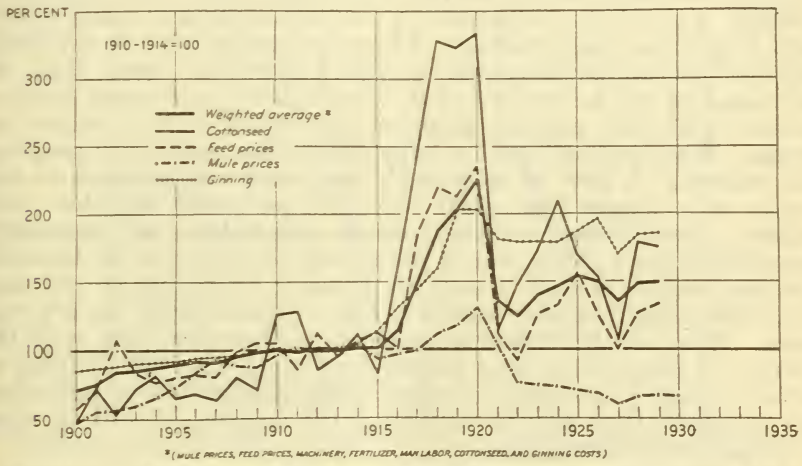


FIGURE 40.—INDEXES OF MULE PRICES, FEED PRICES, COTTONSEED AND GINNING COST FACTORS IN COTTON PRODUCTION

The price of mules is down to a low level and feed prices are low, but the cost of ginning remains on a high level not far from the war peak

High wage rates have encouraged the use of labor-saving machinery, and improvements in farm implements within recent years have made possible a marked change in production methods. The strong demand for improved machinery has probably been a factor in maintaining prices of all farm implements. Ginning costs have also remained high, but in some sections, at least, there have been marked improvements in the work done by the gins so that a part of the increased costs may reflect increased services. Prices of fertilizers are characteristically rather stable. The post-war agricultural depression tended to check the demand for fertilizers, and the depredations of the boll weevil in the heavy fertilizer-consuming sections of the eastern Cotton Belt had further adverse effects on the demand for fertilizers. The development of nitrogen-fixation plants has also lowered the world prices of nitrogenous fertilizers. These forces have tended to keep down the prices of fertilizer materials. Higher transportation costs and wider retail margins, on the other

hand, have kept postwar prices to farmers well above the prewar levels. Cottonseed prices vary inversely with the size of the cotton crop, but the marked increase in the utilization of cottonseed products has increased the demand for seed. The demand for cottonseed oil, meal, and other products, is influenced by the prices of competing materials and this in turn affects the price of the seed. Reduced demand in 1930 depressed cottonseed prices.

Interpretation of changes in the prices of cost items over a series of years requires considerable care. Farm practices have changed materially. New cotton areas have been developed where the factors of production are combined very differently from what they are in the older Cotton Belt. In newer western areas machine costs are a large item, whereas fertilizers are not used except under irrigation. On the other hand, yields were reduced by the weevil in the East and farmers there must now be prepared to use poison. The producing power of a given amount of labor, therefore, is not the same now as it was before the World War even in the same community. Finally, the situations of individual farmers differ widely with respect to cost problems. If ample family labor is available, labor is not an out-of-pocket expense; therefore, losses that are calculated on the assumption that labor is hired, may mean reduced incomes and they may be absorbed by lowering the standard of living. When incomes are low expenditures for productive purposes are reduced. A part of a farmer's equipment can be made to last a year or so longer than usual when it is necessary to reduce cash outlays. On the other extreme, certain expenditures are practically unavoidable for a given year if the farmer is to stay in the business. For this reason farmers sometimes respond differently to cost and price situations than they would if they operated solely on a 1-year basis. Many of the farmer's expenditures, however, vary with the volume of production; this variation is much like the shifting of cotton acreage in response to prices. This condition is so important that it goes a long way in explaining the declines in costs in years following low cotton prices.

FERTILIZER EXPENDITURES

Except in the drier sections of the West and in the rich delta sections, commercial fertilizers are applied to the great bulk of cotton-growing lands. In the East, where they are used most heavily, the influence of variations in applications can be observed on the State average yields. The amounts cotton farmers spend for fertilizers each year follow rather closely the incomes they received from their previous crop (fig. 41). Following high incomes they buy more fertilizers just as they plant larger acreages. Following very low incomes they reduce their expenditures. The quantities farmers get for their money depends upon fertilizer prices, and to the extent that prices fall when the demand is low, the reduction in quantities of fertilizers obtained is less than the reductions in expenditures. It is also possible to differentiate between the effects that prices and yields of cotton have on fertilizer purchases. Such studies show that cotton prices have the greater influence, but yields are also important, especially in those sections in which yields have been most seriously reduced by the boll weevil. In 1927 expenditures for fertilizers would have been reduced much more than they were

had it not been for the favorable yields in the Eastern States in 1926. For the first three months of the 1930–31 cotton season, cotton prices have been lower even than in 1926, but yields in South Carolina in 1930 are the highest since 1920 and in Georgia they are the highest since 1914.

COSTS PER POUND AND PER ACRE BY YIELD GROUPS

Economy in cotton production can be approached from several directions. In the last analysis each farmer must solve his cost problems in the light of his own resources. Conditions differ so widely over the Cotton Belt that specific recommendations are meaningless except when made for local areas. Certain features of the cost problem are brought to light, however, by studying average costs. For one thing, it is necessary to differentiate between costs per pound and per acre. Averages of cost records from many parts of the Cotton Belt show that costs per acre tend to be greater for

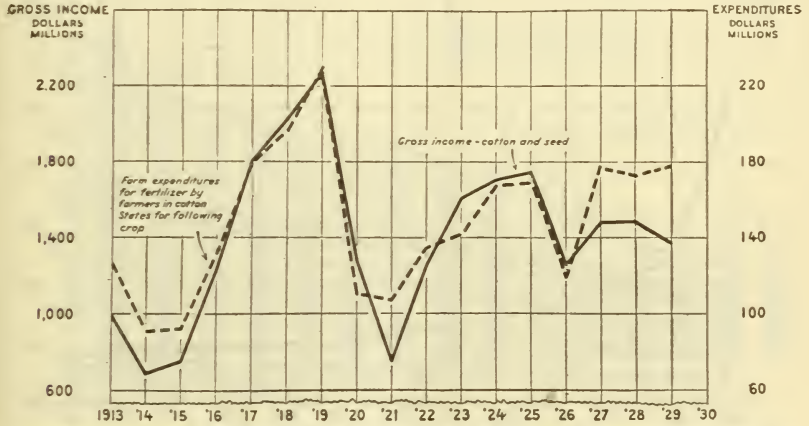


FIGURE 41.—RELATION BETWEEN GROSS INCOME FROM COTTON AND FERTILIZER EXPENDITURES IN COTTON STATES FOR THE FOLLOWING CROP

Farmers' expenditures for fertilizers in the cotton States each year depend largely upon their income from the previous year's cotton crop.

high yields than for low yields, but that costs per pound tend to become less as yields increase. (Fig. 42.) A number of factors are involved in the problem of high yields per acre. Good land is one of the first requirements. Although rents are higher on the more productive lands this is not a hindrance to their use in competition with poor lands. Rather, rents tend to reflect the superior productiveness of good lands. When costs are to be reduced therefore, it becomes especially important to select superior lands. Costs per acre for preparing the land, seed and planting, fertilizing, cultivating, and controlling weevil all tend, on the average, to increase as yields per acre are increased. It is frequently the case, however, that these higher costs per acre are also more than offset by the larger yields obtained.

COSTS PER ACRE OVER THE COTTON BELT

Costs of production per acre vary widely in different sections of the Cotton Belt. These differences are shown by information ob-

tained in 15 counties in 1923. (Fig. 43.) Costs per acre ranged from around $60 in Johnson County, N. C., and $40 in Georgia to about $20 in Lubbock County, Tex. Man and mule labor charges were about half these amounts. Production practices and prices of the factors of production have changed so much since 1923 that costs for that year could not be expected to apply at present, but similar differences in costs still exist. In general costs per acre are higher in the East and lower in the West.

Many conditions contribute to these differences in costs per acre. In the East expenditures are required for fertilizers and weevil control. Weed control is a more difficult task in the humid sections than it is in the drier areas of the West. A large part of the differences in costs per acre are due to the fact that farming is conducted in a more extensive manner toward the West. Cultivators displace hoes, tractors displace mules, the number of acres tended

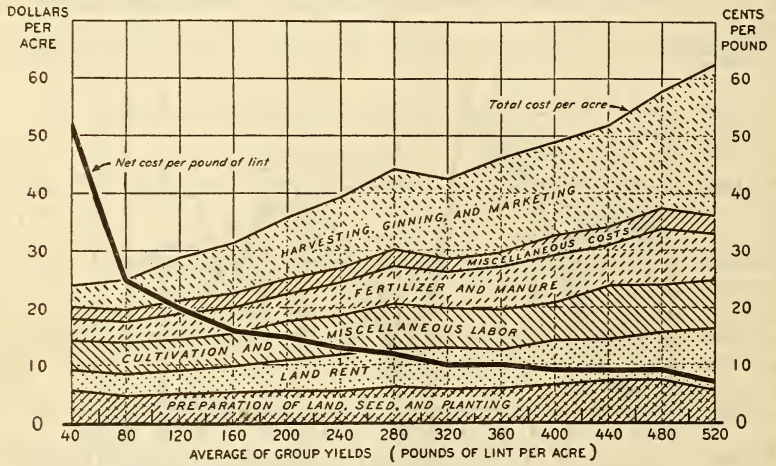


FIGURE 42.—COTTON PRODUCTION COSTS PER ACRE AND PER POUND BY YIELD GROUPS IN 1928

Low yields result in high costs per pound unless the cotton is produced on an extensive scale at little cost per acre. On the average, cost per acre increases as the yield is increased, but cost per pound declines.

by each man is greatly increased. Agriculture developed in the East before farm machinery was available for handling large acreages efficiently. Under the methods then in use small and irregular fields were not especially disadvantageous. Uneven topographic features did not prevent agricultural development so long as pieces of land could be put into crops. Moreover, it paid to carry on a more intensive type of agriculture in the East. Not only were fertilizers and weed control necessary if cotton was to be grown at all well, but it was profitable to work for increased yields. To the West the point at which further increases in yields required undue efforts may be reached much sooner.

The coming of the boll weevil increased the difficulty of the East in competing with the West. Prior to the coming of the weevil, differences in costs per acre were no doubt partly reflections of the different degrees of intensity to which it paid to carry production. The effect of the weevil is shown by changes in yields in Georgia

and South Carolina. For the period 1909 to 1913 yields in South Carolina averaged 230 pounds per acre, in 1921 the yield was 140 pounds, in 1922 it was 123 pounds, and in 1923 it was 187 pounds per acre. In Georgia the 1909 to 1913 average yield was 193 pounds and for the years 1921, 1922, and 1923 the yields were 90, 100, and 82 pounds, respectively. Even though cotton prices were high at that time these yields were unprofitable. In North Carolina, where the boll weevil was not so destructive, cotton acreage increased 42 per cent from 1921 to 1926 in response to the prices then prevailing, despite the high costs per acre, and in Virginia cotton acreage increased 200 per cent in the same period. In these States the advantages of intensive culture had not been lost.

The weevil did not become a problem in the more arid West, and with low costs per acre, high cotton prices made it profitable to

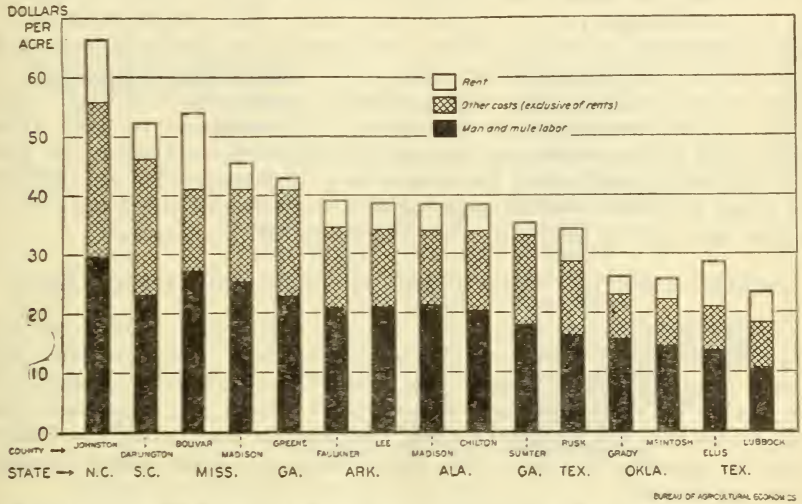


FIGURE 43.—COTTON PRODUCTION COSTS PER ACRE FOR CERTAIN COUNTIES, 1923

The cost of cotton production per acre is much less in the western drier areas of the South than in the eastern humid areas. Cost per acre of man and mule labor in Texas is far below the cost in the Atlantic Coast States.

extend cotton production out into the lower yielding areas. Moreover, the tractor and other improved machinery became available to conduct an extensive cotton culture more effectively. The prices of crops which competed with cotton in much of the western country were low. The result of these situations was that the West made great increases in cotton production at the expense of the Southeast.

During recent years production practices are becoming adjusted to the changed conditions; these adjustments are influencing relative costs and competitive ability of the various sections of the Cotton Belt. Labor-saving methods still characterize the West and this is likely to continue. On the contrary, the machines which are receiving most attention with respect to the future are those like the cotton picker, which will conserve labor still further. The most important development influencing the ability of the Southeast to compete

successfully in cotton production has undoubtedly been the increase in yields since 1922. The yield per acre in 1930 has been the highest since 1920 in South Carolina, and the highest since 1914 in Georgia. Undoubtedly a large element of good fortune is involved in the yields of these States for this particular year, but there seems little question that the better lands in these States can produce yields sufficient to offset acre costs somewhat higher than those of the West.

The East will undoubtedly continue to use more intensive methods of culture, even though land-tenure systems are revised and hilly sections are devoted to other uses. But material reductions in costs per acre appear possible in the East. Larger-scale equipment is being introduced into many sections and there is every reason to believe this movement will continue. One of the important reasons this movement has not spread more rapidly seems to be the difficulty of handling the peak-load requirement for labor at picking time if the cotton acreage per worker is increased. The extent to which it will be possible to reduce labor requirements at picking time or to increase the supply of labor then, or to make better use of time at other seasons of the year, will probably vary with localities. It is obvious, however, that developments will continue to take place which will reduce costs per acre in the East. Nevertheless the East will probably continue to have relatively high expenditures per acre for labor and fertilizer because of soil, weevil, and weed conditions, and because of the increases in yields that can be obtained.

COMPETITION BETWEEN CROPS IN DOMESTIC COTTON BELT

Cotton is characteristically a strong competitor for land and labor in the main portions of the Cotton Belt. Even in such districts, however, other crops offer possible alternatives (mostly in the nature of supplementary enterprises) which are increased when cotton incomes are unsatisfactory. Along the borders of the Cotton Belt the alternatives are more numerous and offer greater competition to cotton.

The nature of these alternatives is shown by trends in crop acreages and the shifts in acreages which took place in 1927. Following the low cotton prices of 1926, every cotton State reduced its acreage of cotton. Texas and Oklahoma, the States with the largest cotton acreages, made the greatest reductions in terms of acres. (Fig. 44.) Corn was the crop substituted in each State. Oklahoma increased its corn acreage over 800,000 acres and Texas increased its corn acreage over 1,300,000 acres. Texas made increases of roughly 50,000 acres each in winter wheat, peanuts, sweetpotatoes, and oats. Oklahoma made insignificant increases in the acreages of peanuts, hay, cowpeas, velvetbeans, and soybeans. Acreage trends for these States show that corn is usually the principal competing crop with cotton in each State but that wheat, oats, and hay are sometimes increased a little when cotton acreage is reduced. In the States in the Mississippi Valley cotton acreage was reduced somewhat by the drought in 1927, but, there too, acreages of other crops were increased. Mississippi, Arkansas, and Louisiana increased their acreages of hay more than they did the acreages of any other crop. In Louisiana, corn was the crop with the second

largest increase, and sweetpotatoes came third. In Mississippi soybeans came second and cowpeas and velvetbeans third. Except for hay, Arkansas made only minor increases in crop acreages in 1927. Acreage trends show that corn is the most important competing crop in each of these States. Since 1921 the corn acreages have been decreasing and the cotton acreages increasing. Corn acreages in these States are of really significant size whereas acreages of other crops are small. In Alabama, Georgia, and South Carolina acreages of hay were increased the most in 1927 and large increases were made in the acreages of cowpeas and velvetbeans. In Alabama a comparatively large increase was made in the acreage of peanuts and a small increase in the acreage of sweetpotatoes. Georgia turned significantly to peanuts and corn and made smaller increases in tobacco, sweetpotatoes, and winter wheat. South Car-

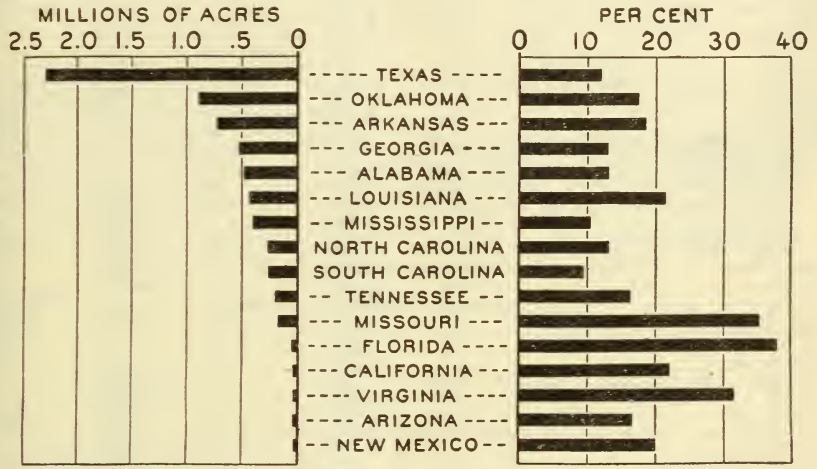


FIGURE 44.—COTTON-ACREAGE REDUCTION IN 1927 FROM 1926

Following the low prices of 1926 every cotton-growing State reduced its cotton acreage. Texas and Oklahoma reduced their acreages the most. Floods in Louisiana and Arkansas probably contributed to the reductions in those States. The largest percentage reductions came in States where cotton must compete with other crops for land.

olina increased its acreage of corn to about the same extent that Georgia did, and increased its acreage of oats, winter wheat, and tobacco. Acreage trends show that corn is a significant competing crop in all these States. Large acreages are devoted to corn and there has been a tendency for several years to shift from corn to cotton. North Carolina turned in a small way to several crops. The largest increase, amounting to 94,000 acres, came in tobacco. Cowpeas and velvetbeans, hay, winter wheat, peanuts, and soybeans were increased in the order named.

Percentage decreases in cotton acreage in 1927 were greatest in the States at the edge of the Cotton Belt. Florida, Missouri, and Virginia each reduced its cotton acreage well over 30 per cent. The large percentage changes in such States reflect a sensitive balancing of opportunities between the production of cotton and alternative crops.

TABLE 1.—*Production of cotton in foreign countries by specified staple lengths, average 1925–26 to 1929–30*

Country	Average 1925–26 to 1929–30			
	Total	Less than 7/8 inch	7/8 inch to 1 3/32 inches	1 1/16 inches and above
	Bales	*Bales*	*Bales*	*Bales*
Mexico	250,507	12,525	225,457	12,525
Venezuela [1]	32,071		32,071	
Colombia [2]	17,342		4,335	13,007
Peru	223,218		55,804	[3] 167,414
Ecuador	6,025		3,012	3,013
Brazil	544,484		217,794	326,690
Paraguay [4]	11,053		11,053	
Argentina	107,146		101,788	5,358
Guatemala [4]	955			955
Haiti [1]	21,997			21,997
Dominican Republic [1]	351		176	175
Porto Rico [1]	1,390			1,390
Salvador [4]	1,345			1,345
British West Indies	4,307			4,307
Italy [5]	3,113		3,113	
Yugoslavia	344		344	
Greece	18,963		18,963	
Bulgaria	2,967		2,967	
Malta [1]	455		455	
Spain [1]	2,584		1,292	1,292
Algeria	6,235			6,235
Morocco (French) [1]	461			461
French West Africa:				
Dahomey [2]	5,062			5,062
Ivory Coast [2]	6,171		6,171	
French Guinea [1]	2,176		1,088	1,088
Senegal [1]	2,696		1,348	1,348
French Sudan [2]	3,913		1,956	1,957
Upper Volta [1]	6,122		3,061	3,061
French Togo [4]	6,669		3,334	3,335
Nigeria	28,498		28,498	
Egypt	1,578,800			[6] 1,578,800
Anglo-Egyptian Sudan	125,429		12,543	112,886
Italian Somaliland	4,833			4,833
Eritrea [1]	1,960		653	1,307
Belgian Congo [2]	22,119			22,119
Angola [1]	2,634		2,634	
Kenya [2]	1,096		1,096	
Uganda	128,397		12,840	115,557
Tanganyika	20,629		15,472	5,157
Nyasaland	4,228		4,228	
Northern Rhodesia [2]	146		146	
Southern Rhodesia [1]	1,498			1,498
Mozambique [1]	8,641		8,641	
Union of South Africa	10,654		2,663	7,991
Cyprus [1]	2,429	607		1,822
Turkey (Asiatic [2])	127,195	84,797	42,398	
Syria and Lebanon	8,611	8,611		
Iraq	3,507			3,507
Russia (Asiatic)	1,007,118		1,007,118	
Persia [1]	90,938	60,626	30,312	
India [7]	4,732,000	2,901,000	1,831,000	
Oomra		1,482,000		
Dhollera		499,000		
Bengal-Sind		796,000		
Comilla, Burma, etc		90,000		
Coconada		34,000		
Punjab (American)			209,000	
Sind (American)			4,000	
Broach			215,000	
Coompta-Dharwar			241,000	
Western and Northern			216,000	
Tinnevelly			131,000	
Salem			31,000	
Cambodia			116,000	
Barsi and Nagar Hyderabad Gaorani			667,000	

[1] 4-year average.
[2] 3-year average.
[3] About 67,000 bales of long rough cotton, 1¼ to 1½ inches, are included in this total.
[4] 2-year average.
[5] Figure for 1929–30 only.
[6] According to information from the International Institute of Agriculture, International Cotton Bulletin, Consular Reports, and Todd, all Egyptian cotton is designated as long staple or 1⅛ inches and above. The Division of Cotton Marketing has received samples of 1 1/16-inch cotton from Egypt which shows that some cotton is below 1⅛ inches, but has no information on quantity.
[7] This classification of Indian cotton according to staple lengths is based on Liverpool interpretations and may vary from a classification based on the official standards of the United States for length of staple.

TABLE 1.—*Production of cotton in foreign countries by specified staple lengths, average 1925–26 to 1929–30*—Continued

Country	Average 1925–26 to 1929–30			
	Total	Less than 7/8 inch	7/8 inch to 1 3/32 inches	1 1/8 inches and above
	Bales	*Bales*	*Bales*	*Bales*
China	1, 862, 914	1, 596, 783	266, 131	
Japanese Empire:				
Japan [2]	1, 261	1, 261		
Chosen	137, 382		34, 346	103, 036
French Indo-China [1]	4, 119		4, 119	
Dutch East Indies [1]	4, 905	3, 679	1, 226	
Siam [2]	3, 429	1, 714	1, 715	
Australia	6, 401		6, 401	
New Hebrides [2]	2, 917		2. 917	
Total	11, 224, 810	4, 671, 603	4, 012, 679	2, 540, 528

[1] 4-year average. [2] 3-year average.

Compiled from official sources, from International Institute of Agriculture, from information based on samples of foreign cotton received by the Division of Cotton Marketing of the Bureau of Agricultural Economics, and from unofficial trade reports.

Because of differences in description of cottons for length of staple in the reporting countries it is not certain that the distributions here shown have been uniformly made nor that they are comparable with cottons classed under the official standards of the United States for length of staple. Distributions are subject to revision on the basis of further work on the classification of cotton of foreign growths.

TABLE 2.—*Production of cotton in India by varieties and staple lengths, average 1915–16 to 1918–19 and annual 1925–26 to 1929–30*

[1,000 bales of 478 pounds net; 000 omitted]

Description	Average 1915–16 to 1918–19	1925–26	1926–27	1927–28	1928–29	1929–30
Mainly under 7/8-inch staple:						
Oomra (Khandeish, Central India, Berar, and Central Provinces)		1, 367	1, 316	1, 582	1, 700	1, 446
Dhollera		527	476	718	336	437
Bengal Sind (United Provinces, Rajputana, Sind, Punjab, etc.)		904	688	654	854	879
Comilla, Burma, etc		104	95	87	77	87
Coconada		45	26	33	38	31
Total	2, 453	2, 947	2, 601	3, 074	3, 005	2, 880
Per cent of total crop	72. 1	56. 7	61. 9	61. 6	61. 8	65. 4
Mainly 7/8-inch staple and above:						
Punjab (American)		300	192	183	159	212
Sind (American)		2	4	3	5	7
Broach		277	186	204	175	235
Coompta-Dharwar		265	168	274	254	244
Western and Northern		322	145	185	292	135
Tinnevelly		151	113	124	136	133
Salem		30	28	28	36	35
Cambodia		130	97	103	122	126
Barsi and Nagar / Hyderabad Gaorani		777	671	812	679	395
Total and above	949	2, 254	1, 604	1, 916	1, 858	1, 522
Per cent of total crop	27. 9	43. 3	38. 1	38. 4	38. 2	34. 6
Total crop	3, 402	5, 201	4, 205	4, 990	4, 863	4, 402

Compiled from Area and Yield of Principal Crops in India, reports of the Indian Central Cotton Committee and the Empire Cotton Growing Review. This classification of Indian cotton according to staple lengths is based on Liverpool interpretations and may vary from a classification based on the official standards of the United States for length of staple.

TABLE 3.—*Production of cotton in the world, in United States, and in foreign countries, 1916–17 to 1929–30*

[1,000 bales of 478 pounds net; 000 omitted]

Season	World [1]	United States	Foreign	Percentage foreign is of world
	Bales	*Bales*	*Bales*	*Per cent*
1916–17	19,900	11,450	8,450	42.5
1917–18	19,700	11,302	8,398	42.6
1918–19	20,900	12,041	8,859	42.4
1919–20	21,300	11,421	9,879	46.4
1920–21	21,100	13,440	7,660	36.3
1921–22	15,400	7,954	7,446	48.4
1922–23	19,300	9,755	9,545	49.5
1923–24	19,700	10,140	9,560	48.5
1924–25	24,800	13,628	11,172	45.0
1925–26	27,900	16,104	11,796	42.3
1926–27	28,400	17,977	10,423	36.7
1927–28	24,000	12,955	11,045	46.0
1928–29	26,100	14,478	11,622	44.5
1929–30	26,200	14,828	11,372	43.4

[1] Estimated.

Division of Statistical and Historical Research. Compiled from official sources and International Institute of Agriculture.

TABLE 4.—*Mill consumption of cotton in the world, in United States, and in foreign countries and exports from United States, 1911–12 to 1929–30*

[1,000 bales approximately 500 pounds gross; 000 omitted]

Season beginning August [1]	Mill consumption [2]									United States exports
	World			United States			Foreign countries			
	American	All other	Total	American	All other	Total	American	All other	Total	
1911–12	15,494	5,672	21,166	4,922	207	5,129	10,572	5,465	16,037	10,885
1912–13	14,630	7,206	21,836	5,250	233	5,483	9,380	6,973	16,353	8,899
1813–14				5,383	194	5,577				9,251
1914–15				5,375	222	5,597				8,322
1915–16				6,081	317	6,398				5,673
1916–17				6,470	319	6,789				5,219
1917–18				6,382	184	6,566				4,175
1918–19				5,590	176	5,766				5,568
1919–20	13,324	6,450	19,774	6,003	417	6,420	7,321	6,033	13,354	5,993
1920–21	10,030	6,465	16,495	4,677	216	4,893	5,353	6,249	11,602	5,753
1921–22	12,757	7,359	20,116	5,613	297	5,910	7,144	7,062	14,206	5,980
1922–23	12,666	8,343	21,009	6,322	344	6,666	6,344	7,999	14,343	4,536
1923–24	11,107	8,345	19,452	5,353	328	5,681	5,754	8,017	13,771	5,530
1924–25	13,256	8,876	22,132	5,917	276	6,193	7,339	8,600	15,939	7,923
1925–26	13,730	9,483	23,213	6,176	280	6,456	7,554	9,203	16,757	7,939
1926–27	15,780	9,082	24,862	6,880	310	7,190	8,900	8,772	17,672	10,900
1927–28	15,407	8,922	24,329	6,535	299	6,834	8,872	8,623	17,495	7,524
1928–29	15,076	9,440	24,516	6,778	313	7,091	8,298	9,127	17,425	7,957
1929–30	13,023	10,555	23,578	5,803	303	6,106	7,220	10,252	17,472	6,650

[1] Consumption figures are for the season beginning Sept. 1 from 1911–12 to 1913–14 and season beginning Aug. 1 from 1914–15 to 1928–29. Export figures are for the season beginning Aug. 1.

[2] Figures of the International Federation in running bales, converted into 478 pounds net or 500 pounds gross using the following conversion factors: 1 Indian bale=0.8 American bale; 1 Egyptian bale=1.48 American bales; 1 "sundries" bale=0.72 American bale except Chinese and Japanese which were counted as equal to American bales.

Compiled from International Cotton Bulletin published by the International Federation of Master Cotton Spinners' Associations and reports of the United States Bureau of the Census and Bureau of Foreign and Domestic Commerce.

TABLE 5.—*Production of cotton in specified countries, 1909–10 to 1930–31*

[Bales of 478 pounds net]

Season	Peru	Argentina	Paraguay	Chosen	Union of South Africa	Greece	Persia	Turkey
1909–10	120,000	1,925	----------	14,828	65	----------	----------	----------
1910–11	88,000	2,099	----------	13,633	29	----------	----------	----------
1911–12	96,000	1,997	----------	18,403	69	12,614	118,200	----------
1912–13	112,000	3,099	----------	25,055	68	----------	142,300	----------
1913–14	133,000	2,454	----------	30,043	150	----------	148,500	----------
1914–15	128,834	3,653	----------	31,156	452	15,265	145,400	----------
1915–16	113,460	4,086	92	39,806	476	8,595	139,100	----------
1916–17	127,309	3,178	92	40,402	477	6,598	99,200	----------
1917–18	125,104	12,167	175	60,863	500	6,189	85,800	----------
1918–19	141,533	14,053	302	68,766	891	8,063	88,900	----------
1919–20	154,774	14,284	891	88,768	1,628	10,224	94,100	----------
1920–21	177,041	25,533	958	101,013	2,245	6,840	104,600	----------
1921–22	186,109	16,129	2,616	82,172	1,762	5,387	----------	[1] 30,000
1922–23	198,875	25,994	5,844	103,410	5,460	8,377	----------	[1] 30,000
1923–24	212,140	58,846	16,265	111,542	7,300	11,135	----------	57,000
1924–25	211,522	70,711	12,222	122,562	14,172	14,220	[2] 59,171	78,400
1925–26	204,308	133,844	11,481	123,214	17,055	14,609	[2] 83,632	105,172
1926–27	246,168	60,419	10,625	142,694	8,571	17,759	[2] 84,610	97,000
1927–28	245,615	101,467	----------	133,000	9,216	12,571	75,007	179,412
1928–29	[1] 210,000	[1] 90,000	[1] 40,000	150,000	10,230	14,875	120,503	----------
1929–30	[1] 210,000	[1] 150,000	----------	138,000	8,200	----------	----------	----------
1930–31	----------	----------	----------	----------	12,000	----------	----------	----------

[1] Unofficial. [2] Exports.

Compiled from official sources, International Institute of Agriculture, except as otherwise stated.

TABLE 6.—*Production of cotton in India, 1891–92 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1891–92	1,421,000	1901–2	2,297,000	1911–12	2,730,000	1921–22	3,752,000
1892–93	1,902,000	1902–3	2,818,000	1912–13	3,702,000	1922–23	4,245,000
1893–94	2,117,000	1903–4	2,645,000	1913–14	4,239,000	1923–24	4,320,000
1894–95	1,860,000	1904–5	3,172,000	1914–15	4,359,000	1924–25	5,095,000
1895–96	2,235,000	1905–6	2,859,000	1915–16	3,128,000	1925–26	5,201,000
1896–97	1,895,000	1906–7	4,129,000	1916–17	3,759,000	1926–27	4,205,000
1897–98	2,069,000	1907–8	2,613,000	1917–18	3,393,000	1927–28	4,990,000
1898–99	2,523,000	1908–9	3,090,000	1918–19	3,328,000	1928–29	4,863,000
1899–1900	912,000	1909–10	3,998,000	1919–20	4,853,000	1929–30	4,402,000
1900–01	2,471,000	1910–11	3,254,000	1920–21	3,013,000		

[1] Bales of 478 pounds net.

TABLE 7.—*Production of cotton in Brazil, 1901–2 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1901–2	197,235	1909–10	324,288	1917–18	413,517	1925–26	601,520
1902–3	315,343	1910–11	356,717	1918–19	406,459	1926–27	484,237
1903–4	293,985	1911–12	360,220	1919–20	460,515	1927–28	505,049
1904–5	324,288	1912–13	417,971	1920–21	476,264	1928–29	553,456
1905–6	438,389	1913–14	476,823	1921–22	504,000	1929–30	[2] 550,000
1906–7	417,971	1914–15	464,813	1922–23	553,000		
1907–8	277,446	1915–16	338,660	1923–24	576,000		
1908–9	318,283	1916–17	336,683	1924–25	605,134		

[1] Bales of 478 pounds net. [2] From an official source.

Division of Statistical and Historical Research. Compiled from official sources and International Institute of Agriculture unless otherwise stated.

TABLE 8.—*Production of cotton in Mexico, 1899–1900 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1899–1900	104, 000	1907–8	174, 219	1915–16	95, 391	1923–24	175, 380
1900–01	101, 000	1908–9	125, 109	1916–17	84, 864	1924–25	196, 332
1901–2	103, 000	1909–10	127, 941	1917–18	63, 649	1925–26	200, 476
1902–3	104, 000	1910–11	200, 455	1918–19	365, 713	1926–27	359, 820
1903–4	169, 000	1911–12	160, 281	1919–20	[2] 199, 000	1927–28	179, 238
1904–5	253, 000	1912–13	240, 033	1920–21	[2] 188, 000	1928–29	278, 000
1905–6	227, 000	1913–14	205, 395	1921–22	147, 030	1929–30	235, 442
1906–7	203, 183	1914–15	----------	1922–23	201, 540		

[1] Bales of 478 pounds net. [2] Laguna district and Lower California only.

TABLE 9.—*Production of cotton in Egypt, 1885–86 to 1930–31*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1885–86	579, 000	1897–98	1, 356, 000	1009–10	1, 036, 000	1921–22	902, 000
1886–87	595, 000	1898–99	1, 158, 000	1910–11	1, 555, 000	1922–23	1, 391, 000
1887–88	621, 000	1899–1900	1, 349, 000	1911–12	1, 530, 000	1923–24	1, 353, 000
1888–89	564, 000	1900–01	1, 126, 000	1912–13	1, 554, 000	1924–25	1, 507, 000
1889–90	671, 000	1901–02	1, 320, 000	1913–14	1, 588, 000	1925–26	1, 650, 000
1890–91	862, 000	1902–03	1, 210, 000	1914–15	1, 337, 000	1926–27	1, 586, 000
1891–92	987, 000	1903–04	1, 349, 000	1915–16	989, 000	1927–28	1, 261, 000
1892–93	1, 082, 000	1904–05	1, 308, 000	1916–17	1, 048, 000	1928–29	1, 672, 000
1893–94	1, 043, 000	1905–06	1, 235, 000	1917–18	1, 304, 000	1929–30	1, 725, 000
1894–95	957, 000	1906–07	1, 440, 000	1918–19	999, 000	1930–31	1, 743, 387
1895–96	1, 093, 000	1907–08	1, 499, 000	1919–20	1, 155, 000		
1896–97	1, 218, 000	1908–09	1, 399, 000	1920–21	1, 251, 000		

[1] Bales of 478 pounds net.

Compiled from official sources.

TABLE 10.—*Production of cotton in Russia, 1914–15 to 1930–31*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1914–15	1, 270, 000	1919–20	81, 000	1924–25	483, 500	1929–30	1, 351, 000
1915–16	1, 512, 000	1920–21	58, 000	1925–26	781, 757	1930–31	1, 950, 000
1916–17	1, 199, 000	1921–22	43, 100	1926–27	773, 000		
1917–18	634, 000	1922–23	55, 300	1927–28	993, 915		
1918–19	161, 000	1923–24	196, 400	1928–29	1, 137, 000		

[1] Bales of 478 pounds net.

Division of Statistical and Historical Research. Compiled from official sources and International Institute of Agriculture.

TABLE 11.—*Production of cotton in China, 1916–17 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1916–17	1, 534, 000	1920–21	1, 882, 957	1924–25	2, 178, 210	1928–29	1, 844, 288
1917–18	2, 092, 000	1921–22	1, 514, 427	1925–26	2, 101, 632	1929–30	1, 752, 000
1918–19	3, 059, 000	1922–23	2, 318, 090	1926–27	1, 741, 586		
1919–20	2, 518, 379	1923–24	1, 992, 926	1927–28	1, 875, 065		

[1] Bales of 478 pounds net.

Compiled from Chinese Economic Bulletin quoting Chinese Mill Owners Association.

TABLE 12.—*Production of cotton in Uganda, 1909–10 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1909–10	11,588	1915–16	18,274	1921–22	40,419	1927–28	116,000
1910–11	17,456	1916–17	23,310	1922–23	73,678	1928–29	164,000
1911–12	22,004	1917–18	23,006	1923–24	107,619	1929–30	100,412
1912–13	23,414	1918–19	30,569	1924–25	164,046		
1913–14	27,226	1919–20	39,912	1925–26	151,344		
1914–15	21,948	1920–21	81,998	1926–27	110,231		

[1] Bales of 478 pounds net.

Compiled from official sources.

TABLE 13.—*Production of cotton in Anglo-Egyptian Sudan, 1909–10 to 1929–30*

Season	Bales [1]	Season	Bales [1]	Season	Bales [1]	Season	Bales [1]
1909–10	12,552	1915–16	13,556	1920–21	25,539	1925–26	106,460
1910–11	17,573	1916–17	19,456	1921–22	20,145	1926–27	131,007
1911–12	12,552	1917–18	9,623	1922–23	23,687	1927–28	110,573
1912–13	11,715	1918–19	10,460	1923–24	38,221	1928–29	141,747
1913–14	8,368	1919–20	19,381	1924–25	40,665	1929–30	137,359
1914–15	20,084						

[1] Bales 478 pounds net.

Compiled from official sources and reports of British Cotton Growing Association.

THE COTTON OUTLOOK, 1931–32

The following statement presents a brief review of certain phases of the cotton situation during recent years, up to the early part of November, 1930. In conformity with existing legislation that limits the scope of reports on cotton, no attempt has been made to make any forecast or prediction with respect to future prices of cotton or the trend of these prices.

Cotton prices trended gradually downward from 1923 to the beginning of the 1929–30 season, and declined severely throughout 1929–30. In September and October of 1930, prices seemed to have become somewhat more stable but were at the lowest level since 1915. The outstanding cause of the price decline during the last 18 months was the world-wide business depression, which reduced the demand for cotton. World consumption of American cotton was at high levels from 1926–27 to 1928–29, inclusive, but was 2,000,000 bales less in 1929–30 than in 1928–29. The rate of consumption continued to decline throughout 1929–30, and reached a low point in August, 1930. Since August, 1930, however, some increase in rate of consumption is in evidence. The decline in consumption was greater than the average decline in other business. Cotton consumption usually declines more rapidly during depression and increases more rapidly during recovery than is true of the average rates of all industrial production. Business activity in the United States has continued downward about as far and as long as in previous major depressions, but it is uncertain just when recovery will start. Foreign countries are generally still depressed but some improvements have taken place in cotton textile industries abroad.

The small consumption of cotton in 1929–30 as compared with recent years left a world carry-over of American cotton on August 1, 1930, about 1,800,000 bales greater than on the same date of the

previous year. This carry-over, added to the current crop, gives a world supply of American cotton for the 1930–31 season of about 20,700,000 bales, which is 1,400,000 bales greater than for 1930 and 300,000 bales greater than the annual average supply for the 5-year period 1925 to 1929. It should be recalled, however, that the relatively large supplies during this 5-year period occurred when consumption was at record levels. Cotton acreage in the United States increased rapidly following the World War, and in the last five years it has tended to remain at high levels. Farmers usually reduce the cotton acreage and spend less for fertilizers following the years of low prices. The maximum reductions in acreage since 1900 has been 15 per cent, obtained in 1915, 1921, and 1927. Yields during the last two years have been held in check by drought, although serious weevil damage has not been widespread and weevil numbers at present are low in most of the belt.

Commodity prices in general have fallen materially during the last 18 months, both in this country and abroad. Cotton prices declined more than the average of all commodities. In the 1929–30 season the price of Middling 7/8-inch cotton averaged 15.79 cents per pound at the 10 spot markets, in comparison with 18.67 cents the previous season and 19.72 cents in 1927–28. For October, 1930, the price averaged 9.82 cents, compared with 11.81 and 10.77 cents in the lowest months of the 1926–27 and 1920–21 seasons respectively. Except for 1914–15 and 1908–9, prices in October, 1930, were below any seasonal average since the 1904–5 season.

World consumption of all cottons in 1929–30 fell 4 per cent below that of 1928–29, the reduction being equivalent to about 700,000 American bales as calculated from reports of the International Federation of Cotton Spinners. The consumption of Indian and sundries cottons, however, was higher than in 1928–29 by about 1,100,000 bales of equivalent weight. Consumption of Egyptian cotton fell slightly.

Reduction in the total world consumption came almost entirely in American cotton. World consumption of American cotton in 1929–30 amounted to 13,023,000 running bales, compared with 15,076,000 in 1928–29, 15,407,000 in 1927–28, and the record consumption of 15,780,000 in 1926–27, according to statistics of the International Federation Cotton Spinners. Of the 2,000,000 bales by which the world consumption of American cotton was lower in 1929–30, approximately one-half of the reduction occurred in the United States and the other half in Europe. Consumption of American cotton declined 436,000 bales in Great Britain; approximately 100,000 bales each in Germany, France, and Russia; 81,000 bales in Italy, and 56,000 bales in Czechoslovakia. On the whole, Europe used more Indian and sundries cottons, and less American and Egyptian cottons. Asiatic countries consumed as much American cotton as they did in the previous season, but their increase in consumption was of Indian and sundries cottons.

Domestic consumption of American cotton as reported to the Census Bureau for the two months ended September 30, 1930, was 719,000 bales, as compared with 1,050,000 for the corresponding period in 1929. World consumption of American cotton for the same two months, according to the New York Cotton Exchange Service,

amounted to 1,713,000 bales, compared with 2,325,000 bales for the corresponding period last year, 2,367,000 for 1928–29 and 2,841,000 for 1927–28.

Business activity in the United States has continued downward about as far and as long as in previous major depressions. The domestic situation in Great Britain has shown no material change, and exports of cotton piece goods were still declining in September. Although some moderate recessions have occurred in the countries of western continental Europe, they have avoided a large part of the depression which has affected other countries. Germany and the rest of central Europe is still depressed, but there may be some significance in the fact that the cotton textile industry of Poland has increased its activity materially during August and September. The depression continues in Japan. There has been some recovery in the value of the Chinese silver dollar recently, and if this recovery is maintained and trade conditions with the interior remain satisfactory, China will be able to buy more cotton goods. Such developments would tend to increase the demand for American cotton in Japan and Great Britian. The increase in the rate of cotton consumption when business recoveries begin is usually more rapid than the average increase in the rate of activity of all industries. General commodity price levels also tend to rise with business recoveries.

The American crop of 1929 amounted to 14,828,000 bales of 500 pounds gross weight and the world carry-over of American cotton at the beginning of the cotton year amounted to about 4,500,000 running bales, according to the Census Bureau, giving a total composite supply of 19,300,000 bales of American cotton. This was 1,500,000 bales smaller than the supply of 1927–28, when prices averaged 20 cents per pound at New Orleans, and 300,000 bales smaller than in 1928–29, when prices averaged 19 cents per pound. The lower prices in 1929–30, despite smaller supplies, were the result of depressed demand. As domestic consumption and exports fell, cotton failed to disappear at the rates of the last few years, and on August 1, 1930, the carry-over in this country was the largest since 1921. Stocks of American cotton in foreign countries had been reduced, but with the large increase in the United States the world carry-over of American cotton rose from 4,500,000 bales on August 1, 1929, to around 6,300,000 bales on August 1, 1930, according to the Census Bureau reports for the United States and commercial reports for foreign countries. The crop was forecast in November at 14,438,000 bales, giving a supply for the season of about 20,700,000 bales, or 1,400,000 bales more than for last season and nearly the same as for 1927–28.

World stocks of foreign-grown cottons, according to commercial reports so far available, did not show much change on August 1, 1930, as compared with a year earlier. Stocks of Egyptian cotton were 275,000 bales larger, and, probably because of the Egyptian Government's stabilization activities, this increase in stocks was mostly in Alexandria. Stocks of Indian and sundries cottons showed insignificant decreases. Cotton plantings in India up to October 1 this year are officially reported about equal to those last year, and the season so far has been favorable to the crop. The Egyptian acreage this year, according to official reports, was increased 13 per cent. Russian cotton acreage has been increasing

rapidly during recent years, in accordance with a long-time developmental program, and production this year, according to information received by American Agricultural Commissioner Steere at Berlin, is estimated at about 1,950,000 bales, compared with 1,351,000 bales last year and a previous record production of 1,512,000 bales officially reported in 1915.

Marked expansion in cotton acreage has taken place in the United States since the World War. For the five years 1925–1929 the average number of acres of cotton harvested annually in the United States was 44,882,000 acres, compared with 34,022,000 for the five years immediately following the World War. In 1926 the acreage harvested was 47,087,000—the largest in history. Low prices that year were followed by an acreage reduction of 15 per cent in 1927. By 1929, however, acreage had again increased and amounted to 45,793,000 acres, but the price averaged only 15.79 cents for the season, and in 1930 acreage fell slightly. The area for harvest on November 1, 1930, was 44,791,000 acres.

Yields for the country as a whole have been held in check during the last two years by droughts, but these droughts have reduced weevil damage. The number of weevils entering hibernation in the fall of 1929 was small because of the drought in that year. A small number of weevils entered hibernation in the fall of 1929, and low winter temperatures destroyed many weevils in hibernation. These conditions and the drought of 1930 prevented widespread weevil damage this year. There are comparatively small numbers of weevils in the central and western part of the belt, despite some increase in the number following the late rains. In the Atlantic States the weevil population is about the same as last year. Yields in the Eastern States are influenced by the quantities of fertilizers applied, and following years of reduced income expenditures for fertilizers are lowered. For the last four years yields for the belt as a whole have been close to the 10-year average of 155 pounds per acre. This average is influenced slightly more by the very low yields of 124 pounds in 1921, 141 pounds in 1922, and 131 pounds in 1923, than by the high yields of 183 pounds in 1926 and 178 pounds in 1920, so that yields during recent years have been only moderate.

The domestic supply of cotton with a staple length of thirteen-sixteenths of an inch and shorter was 917,000 bales, or 42.5 per cent greater in 1929 than in 1928, and the supply of cottons having a staple length of seven-eighths of an inch and longer was 564,000 bales, or 3.9 per cent less in 1929 than in 1928. This increase in the supply of the shorter-staple cotton in 1929 was apparently due, in part, to the 1929 drought, which resulted in a larger proportion of the shorter staples in the 1929 crop. Cotton with a staple length of thirteen-sixteenths of an inch, sold at discounts of $2.50 to $4 a bale in 1928–29, as compared with $7.50 to $10 a bale in 1929–30 and about $5 in early November, 1930, at the central markets. Premiums for each staple length from fifteen-sixteenths of an inch to 1¼ inches gradually increased during 1928–29 and reached a high point toward the end of 1928–29 and the beginning of 1929–30. During the early part of 1929–30 there were some declines, but the average of the season for each staple was above that for 1928–29.

From August, 1930, to date premiums have declined somewhat, but, relative to the level of cotton prices, premiums are still above what they were during the corresponding period in 1928. For example, the average staple premium on inch cotton amounted to about $5 per bale in 1928–29, compared with about $6 per bale in 1929–30 and to about $4.50 per bale in early November, 1930. These changes in staple premiums and discounts indicated that, compared with the demand, the supply of cotton with a staple length of thirteen-sixteenths of an inch and shorter in 1929–30 was relatively greater than that for cotton of any other staple length. The disappearance of cotton with a staple length of thirteen-sixteenths of an inch and shorter was 626,000 bales, or 31 per cent larger in 1929–30 than in 1928–29, while the combined disappearance of cottons having a staple length longer than thirteen-sixteenths of an inch fell off 2,861,000 bales, or 23 per cent. In other words, although proportionately more of the shorter than of the longer lengths were consumed in domestic mills or exported, this was accomplished only at a distinctly greater price reduction.

The general outlook for agricultural-production credit in the cotton-growing States during the 1931 crop year appears less favorable than for any recent year. As a result of the low level of prices received for cotton marketed during the current season, the flow of income into agricultural communities of the South has been materially reduced. Country banks have been unable to secure the normal liquidation of loans representing advances utilized in producing the 1930 crop, and this carry-over of loans will curtail their ability to meet the normal credit requirements in producing next year's crop. As a result of low cotton prices in 1926, it may be recalled that the volume of funds available for loans in connection with the 1927 crop was greatly reduced. A similar or even greater curtailment may be anticipated for the year 1931. As indicated in the section dealing with agricultural credit, there is a large percentage of farmers who do not carry a mortgage indebtedness upon their farms; this gives the general credit situation a more favorable outlook than would be implied by the curtailment in the potential supply of production credit. It is also probable that the 1931 crop will be produced with a relatively smaller cash outlay than that of the past season.

The cotton crop of 1930 probably was produced at a lower cost per acre than either of the preceding two crops. The dry growing season which made weed control relatively easy probably resulted in lower labor expenses to farmers who depended on hired labor. Because of the drought expenditures for weevil control were also below normal. Labor during the present harvest season has been plentiful, and prevailing picking rates have been lower than in any season during the last 15 years. Unless industrial activity increases markedly, labor will probably be plentiful next season and wage rates, at least through the growing season, are likely to be lower than in 1930. Retail prices of fertilizers are now lower than they were last spring, and with prospects for reduced sales, further reductions in fertilizer prices seem probable. On the other hand, supplies of home-grown food and feed crops in the drought areas are the smallest in years, and the quantity that farmers in these areas will need to buy will probably entail relatively heavy expenses during the coming year.

LONG-TIME OUTLOOK FOR AGRICULTURE IN THE SOUTHERN STATES

A long-time outlook for southern agriculture is necessarily closely related to the outlook for agriculture in general as modified by the special conditions peculiar to the South as a region.

At present (November, 1930), the average price of farm products is lower than it has been in any single year since 1915, and the ratio of that average to the average of prices paid by farmers for commodities bought is lower than in any year since 1910, when the indexes indicating this relationship was begun. Grain and cotton prices, upon which the prosperity of so large a proportion of American farmers largely depends, are especially low. Conditions have been aggravated over large areas by the drought.

These unusually unfavorable conditions are likely to be reflected, in the immediate future, in some further recession of land values and perhaps in an increased rate of forced sales and other kinds of related defaults.

It is unlikely that one would be justified in viewing the long-time outlook for agriculture in the light of the natural pessimism prevailing in so unfavorable a year. From the point of view of the low condition of agriculture in 1930, the general outlook is most probably one of improvement within the next year or two. From the low level of 1921 the relative purchasing power of farm products in terms of the prices of things farmers buy had reached a level by 1923 that it has maintained, with minor fluctations, since that year, until 1930, when there was a marked recession. It is possible that with business recovery prices of agricultural products will improve more rapidly than prices of nonagricultural products.

The income from agricultural production of 1930 is likely to be considerably lower than was realized in 1929. The gross income from agriculture in 11 Southern States amounted to $3,435,000,000 in 1925. The big cotton crop of 1926 was accompanied by a reduction of about $300,000,000 in gross income. Part of this reduction was recovered in 1927–28, to be lost in 1929. The agricultural income of these States in 1929 was 4 per cent below that of 1928. The recovery in prices from the present depression may not be sufficient to bring the gross income of the South, within the next few years, back to the level of the last five years.

Basic tendencies do not point toward a period of unusual agricultural prosperity or justify the expectation that a notable expansion of agriculture in general or of particular lines of production will be justified. This conclusion rests on a number of tendencies, some of which were mentioned in the 1930 national outlook report.

For one thing, many students of the situation think that the gradual downward trend of general commodity prices may continue, although some recovery from the present level is to be expected. The average prices of all commodities declined about 19 per cent from 1925 to September, 1930. A large part of this decline, 14 per cent, has occurred during the last 12 months. Southern farm products appear to face a period of unusually keen competition during the next few years, at least. The expansion of grain and cotton production into semiarid areas of relatively level topography under mechanized types of farming has been temporarily checked by un-

favorable conditions, but large areas of these lands remain for future development. It seems likely that extensive undeveloped areas of this kind in various parts of the world will be put in cultivation during the next decade. The movement for greater national self-sufficiency in many European countries has affected unfavorably the demand for United States farm products, especially the food products. There is a general tendency in European countries toward legislation for stimulating agriculture, partly by granting protection against foreign agricultural imports, modified by preferential agreements for importation of farm products from neighboring countries. The decreasing rate of natural increase of population in the United States appears to have its counterpart in other countries where industrialization is making headway.

Southern agriculture, as well as agriculture in other parts of the United States, is being profoundly affected by the increased commercialization of agriculture, and the increase in wants that must be satisfied by purchase rather than by consumption direct from the farm. Farm people are rapidly developing a desire for the kinds of goods which many people in cities enjoy. They want better houses and furniture, better clothing; they want automobiles and radios, telephones, and kinds of food that must be purchased rather than raised on the farm. Many of the farms in the South and in other parts of the United States, capable of supporting the backwoods mode of living of an earlier day, are incapable of yielding a sufficient money return to maintain modern standards of living.

Furthermore, farmers are more and more considering the value of their own labor and becoming unwilling to use it for a return notably less than it will command in other occupations. In July, 1930, the index number of industrial wages stood at 224, as compared with the average for 1910-1914, inclusive, considered as 100, while the index number for farm wages was only 160, and the prices of 30 principal farm products 108. Moreover, a comparison of the trend in farm wages in typical cotton States with the trend in northern general farming States indicates that the differential, heretofore to the disadvantage of the Southern laborer, has increased still further during the past decade. These facts make the increasing tendency for farmers to compare returns in other occupations with returns from farming one of great significance.

Although the staple-producing sections of the South have long been highly commercial, other extensive sections (mostly outside of the Cotton Belt and handicapped by remoteness or natural conditions unfavorable to economical production) have continued in a semi-commercial or a largely self-sufficing farm economy. The South has a larger number of farms of this type than any other important section of the United States. Changing standards of living and of labor valuation, combined with the unfavorable conditions for general farm products, have led to considerable farm abandonment in such sections. It seems probable that these tendencies will continue for some years.

Some of the commercial sections of the South have also experienced notable decreases in number of farms, partly for the above reasons and partly because of unfavorable prices and conditions of production. This was especially notable in the Georgia plantation

piedmont area, and to a somewhat less extent in the South Carolina piedmont. The collapse of cotton prices in 1921 struck this area at a time when the planters and farmers had heavily extended their credit obligations. The progressive spread of the boll weevil, supplemented by losses from drought, greatly disorganized agriculture in this area, and in less extreme form over other extensive areas in the old Cotton Belt. Experience has shown that recovery of agriculture, after the initial invasion by the boll weevil, is slow by reason of extreme dependence on a commercial crop, prevalence of extensive landholdings many of which are under nonresident ownership, the prevailing credit system which emphasizes cotton, and the fact that soils are depleted by long and exhausting use under single cropping.

During the last five years the tendency toward a decrease in number of farms has been reversed in most of the principal cotton States except the Carolinas and Tennessee. Mississippi shows an increase of more than 55,000 farms, Texas and Louisiana about 30,000 each, Alabama and Arkansas about 20,000, and Georgia and Oklahoma about 7,000 each. Of the cotton States, only South Carolina and Tennessee experienced a decrease in number of farms in both 5-year periods, the latter losing heavily in both periods. Georgia was a large net loser during the 10 years, but in each of the six cotton States west of Georgia there was a net increase in number of farms, amounting in the aggregate to more than 150,000. This increase is mainly related to expansion of the cotton acreage, discussed later in this report. On the other hand, Virginia, Kentucky, Tennessee, and North Carolina have experienced decreases in number of farms within the last five years. These decreases are probably connected with types of farming not based on cotton and involve mainly small farms of inferior natural advantages hitherto only semicommercial.

Changes in numbers of farms are not always indicative of proportionate changes in amount of land in cultivation. In the lower South particularly extensive decreases in number of farms from 1920 to 1925 frequently signified partly a disappearance of some of the cropper holdings on plantations managed as single units, where some of the arable land formerly in such holdings continued to be operated by addition to other tenant holdings or by hired labor. The reverse is also true, in part, where cotton farms are rapidly increasing.

Thus Texas, which according to the census, gained nearly 30,000 new farms from 1920 to 1925, lost slightly in crop acreage harvested. All the other cotton States showed a decrease in 1920 to 1925 in crop acreage harvested. The decrease was extremely heavy in Georgia, very minor in Texas, and very considerable in the other States; but all the cotton States showed an estimated increase during the last four years, which was sufficient to result in a net increase for the decade in every major cotton State except Georgia and South Carolina. South Carolina, however, which lost nearly 15,000 farms from 1925 to 1930, increased its acreage in harvested crops by an esimated 16 per cent. There was a net loss for the decade in the crop acreage of Virginia, Kentucky, and Tennessee.

Thus, excepting South Carolina and Georgia, the principal cotton States have demonstrated their ability to expand their cultivated

acreage during a decade of general agricultural depression. In all the States in which such an expansion occurred, except Alabama and Oklahoma, the expansion is more than accounted for by the increase of cotton acreage. Thus, the relative importance of cotton in southern cropping systems, as measured by the percentage of the cultivated acreage in cotton, greatly increased from 1920 to 1929 in every southern State except South Carolina and Georgia, and except in Florida and Kentucky, which are of only minor significance in cotton production. In Georgia, the percentage appears to have increased between 1925 and 1929.

These tendencies are not surprising when it is noted that from 1922 to 1929, inclusive, the index number of the price of cotton has been above the index number of the 30 principal farm crops (including cotton) in every year except 1926 and 1927, and has averaged 163 as compared with 135 for the 30 principal crops. The increased relative importance of the cotton acreage is all the more significant in view of the fact that during the last decade there has been a considerable increase in the acreage of other commercial crops, such as tobacco, citrus fruit, and truck crops, although the increases have been concentrated mainly in a few States in each case.

For the most part, the increased predominance of cotton corresponds to a relative, and in some States an absolute, decrease in the principal feed crops. This is connected with a notable decrease in livestock population which still further emphasizes the increased predominance of cotton in southern agriculture.

The rapid mechanization of agriculture in certain parts of the United States, and especially the increased use of tractors, automobiles, motor trucks, and grain combines, is exerting, and will exert for some years, a most important influence on American agriculture, particularly in the South. In addition to increasing the competition encountered by grain and cotton producers through stimulating expansion of those products, it has shifted from feed production extensive areas of crop and pasture land that were formerly required to maintain horses and mules. This tendency has been accentuated by the steady decrease from 1920 to 1929 in number of beef cattle in the United States as a whole and in nearly every State. The great decrease in number of work stock and beef cattle, combined with the tendency to economize feed by selecting more efficient types of livestock and more economical kinds of feeds, has contributed toward an excess of certain kinds of pasture, hay, and feed grains. This has contributed not only to relatively low prices for such commodities, but also to a shifting of livestock production to the areas where conditions are most favorable and away from the less favorable areas.

The South shared in the downward movement of the beef-cattle cycle from 1920 to 1929 with a greater proportional decline than was experienced in the other parts of the country. There appears to have been a slight reduction in the number of dairy cattle in the South during this period.

The decade 1920 to 1929 also witnessed a general and extensive decrease in number of swine on southern farms. It ranged from a decrease of 23.8 per cent in Oklahoma to 52.4 per cent in Tennessee. During the decade swine production was increasing in the western part of the Corn Belt and in the northern Great Plains at

the expense of the South and the Northeastern States and most of the East North Central group. Most of the decrease in the South occurred from 1920 to 1925, and in the next four years the decreases were not notable, and there were slight increases in several States.

Sheep are not very important in southern agriculture, except in Texas and Kentucky, yet there was a decrease in all Southern States from 1920 to 1929 except in those two States and in Virginia and Oklahoma.

There was a substantial increase in number of chickens on farms in all of the Southern States, except Mississippi, Alabama, South Carolina, and in Georgia where there was a slight decrease.

The general decrease in number of livestock other than poultry was associated with and probably due in part to the large decrease in number of farms in the southeastern cotton States. It is probable also that the liquidation of livestock holdings was partly due to distress selling in some of the Southern States during the years of severe depression following 1920. The net result, however, has been to reduce greatly the relative importance of livestock husbandry in southern agriculture.

It seems probable that the tendency toward the reduction in number of livestock on southern farms, except possibly work stock, is essentially complete. On the other hand, there do not appear to be strong reasons for expecting a rapid return to the larger livestock population prevailing at the beginning of the last decade, especially in the cotton States. The decrease in number of work stock due to mechanization is likely to continue for some years and to stimulate the shift of livestock production to other areas that have more favorable conditions for producing livestock on a commercial basis.

The outlook for commercial dairying in the United States points in general toward lower price levels and keener competition than has prevailed during the last few years. Even with the passing of the immediate effects of the drought and the return to normal business conditions, the dairy industry will probably find itself still somewhat overexpanded, particularly if other lines of farm production continue to offer poor alternatives for more profitable operation. However, the Southern States did not experience a very heavy liquidation during the last decade in number of cows and heifers kept for milk, and at the present time the number is almost as large as in 1920. The steady growth of southern cities has provided an increased local demand, and there has been some tendency in sections in which cotton has become unprofitable to introduce dairy cows as a supplementary source of livelihood. In the Cotton Belt, commercial dairying encounters serious obstacles in the prevailing tenancy and credit systems, lack of experience in dairy operation, lack of marketing machinery, unsuitable types of pasturage, and in some sections presence of the cattle tick. Here and there, however, gratifying progress is being made in overcoming these difficulties. There has been a considerable increase in production of manufactured dairy products, although the aggregate output is still relatively small. It appears likely that there will be a gradual development of dairying as southern urban markets expand and dairy-manufacturing facilities become available, or as a means of supplementing the family food supply. But it has yet to be demonstrated that for the greater part

of the Cotton Belt there is justification in expecting a notable development of dairy production for the supply of outside markets in competition with northern products.

The present difficult position of beef-cattle producers, which is due to a decline in demand on account of business depression, a reduced feed supply owing to the drought, and the necessity of maintaining a beef-cattle population somewhat larger than two years ago, is likely to be improved, temporarily at least, with the return of more normal conditions. There are certain parts of the South in which the beef-cattle industry has been long established, including the bluegrass areas of the border States and the range areas of Texas and Oklahoma. An old established range industry in parts of the Gulf coastal plain and in Florida, maintained against such disadvantages as the tick, the relatively poor grade of forage, inferior types of stock, and the low market rating, has gradually become less important, partly because of real-estate developments and partly because of the expansion of cultivated acreage in that territory. Outside of the existing specialized areas, the production of beef does not at present promise to be an extensive development in southern agriculture.

Somewhat the same observations apply to hogs and poultry in the South as to dairying. The production of hogs is likely to be affected for some years by the conditions that have caused a decrease in the South during the last decade. There may be a gradual increase in production to meet local needs, but a considerable expansion for the supply of extra-sectional markets appears unlikely.

The number of poultry has apparently decreased within the last four years in States like Georgia, Alabama, and the Carolinas, where it would be expected that their increased production for home use at least or for the supply of local markets would have afforded a helpful means of tiding over a severe period of economic readjustment. On the other hand, poultry have increased notably in the Southwestern States where cotton has been expanding rapidly. In general, the great expansion of commercial poultry production in the Cotton Belt, except in certain specially favored areas, is limited by the same factors that limit the expansion of other forms of livestock production—lack of relatively cheap feed, lack of aptitude on the part of a large proportion of the population, and the existence of the special economic conditions that emphasize the production of cotton. There is likely to be sharp competition in poultry production in the United States during the coming years. It is not improbable, however, that means will be found to develop a greater degree of poultry production for domestic use on cotton farms as tenancy and credit relationships are gradually modified.

The indication that livestock production does not hold out promise of displacing cotton to a material extent in southern agriculture applies also to the other money crops. Within the last few decades a number of commercial crops have been added to the list of southern-grown products but without materially displacing cotton except in limited areas; nor do they seriously threaten the predominance of cotton. Rice in the Southwest has developed to the point of occupying nearly 900,000 acres, and when market conditions permit, there is said to be a considerable area of potential rice land where the industry may further develop. The demand for rice in the

United States is likely to increase gradually, with the increase of population, but this product is subject to keen competition from the Orient. For the most part the area in cultivation and the potential area comprise territory not previously devoted to cotton or other crops.

Sugar, one of the important antebellum crops, has actually lost ground during recent years through the mosaic disease and extremely low prices resulting from the world-wide overproduction. The mosaic disease has been largely met by the introduction of resistant varieties; and the higher tariff rates recently imposed and attempts at control of the production and marketing of the Cuban crop may bring some slight improvement. However, the Louisiana industry appears to be confronted with a prospect of the continuance of keen competition, including the possibility of increased production in the new sugar territory of the Florida Everglades. There is little likelihood of a material expansion of the Louisiana industry, and the territory occupied is, for the most part, not adapted to cotton.

Flue-cured tobacco has been a notable addition to the list of southern commercial crops. It has provided a profitable substitute for cotton in certain sections of the Carolinas and Georgia where such a substitute seemed very desirable, and production has increased rapidly for a number of years. But as indicated in another part of this report, it is probable that the rapid expansion in demand due to increased cigarette smoking will not continue. In that case, further expansion should be made with caution.

Peanuts constitute another cash crop that has become important in some parts of the South. The outlook for increasing the demand for this crop is somewhat uncertain, for the markets of this country are subject to very keen competition from the Orient, but peanuts continue to be found useful as a feed crop in various parts of the South where hog production is profitable.

For the most part, the peach industry has been supplementary to, rather than competitive with, cotton in the use of land. The outlook for the next few years appears favorable, but any expansion should be made with caution because of market limitations.

A similar observation applies to watermelons, strawberries, sweetpotatoes, potatoes, and various other commercial truck crops which have come to occupy an established place in southern agriculture. For the most part they are grown outside the Cotton Belt. The total acreage that can be developed without reaching the point of overproduction is very limited as compared with the large potential acreage in the South capable of producing such crops even without seriously encroaching on present cultivated acreage.

The growth of industrial cities, together with further improvement in equipment for and methods of handling fresh fruits and vegetables in the late fall, winter, and early spring months, is likely to continue to increase the demand for the fruit and vegetable products of the South. Within the last 10 years there has been a very rapid growth in the winter consumption of fresh fruits and vegetables. Transportation rates and facilities for handling the products have been so developed that it is possible now to place fresh fruits and vegetables in good condition in northern markets throughout the season, and sell them in the winter time at prices not far in excess of, and sometimes less than, the prices of such products

produced locally for the northern markets, in season. This has resulted in a great increase in the consumption of such products. Since the markets are now being fairly well supplied throughout the country, there is not much opportunity for expanding the business further by developing new market areas, but the growth of cities and some towns, which is proceeding at a fairly rapid rate, together with the increase in distribution by truck from wholesale centers to smaller communities, will continue to increase the demand for these products at a moderate rate. Some competition in certain truck crops may be expected from Mexico and the Caribbean Islands, but competition from these sources is not likely to be sufficient to prevent a moderate increase in the demand for these products of the Southern States.

Demand for the citrus fruits of Texas and Florida is increasing, both in the United States and in foreign countries. Canada is a near-by market of growing importance, and some grapefruit and oranges are beginning to find markets in northern Europe in competition with the fruits from the Mediterranean Basin and South Africa. The growth of population in the United States is also contributing to an increase in demand, but the rate of increase in the domestic demand during the next 10 years is hardly likely to be as great as during the last 10 years. It is not probable that the per capita consumption in the United States can be increased at as great a rate as it has increased in the last 10 years without a material reduction in prices. Competition with California in the production of oranges, in particular, is a factor that southern producers must take into account. The number of young trees not yet in bearing in the lower Rio Grande area is very large in proportion to the acreage in bearing trees, not only in the valley but also in other parts of the South.

When all the alternatives are considered it appears that cotton must continue to be the mainstay of southern agriculture. Therefore, the long-time outlook for the maintenance or expansion of cotton production is the keystone to the general outlook for the agriculture of the South.

Cotton producers face a number of important long-time problems. World commodity price levels in general have had a downward trend ever since the World War. This has affected cotton prices as well as the prices of other commodities. In time retail prices of commodities bought by farmers and production costs can be expected to adjust themselves to lower levels. While the changes are taking place, however, producers whose products are sensitive to price changes receive lower prices for what they sell without receiving equivalent reductions on what they buy.

Demand for cotton, the great crop of the South, increased at a very rapid rate following the World War, until 1928. During the last two years the demand has fallen off, largely because of an accumulation of cotton goods and a curtailment in general business activity. Doubtless the curtailment in demand of the last season is temporary in so far as it is due to a temporary business depression. The world's demand for cotton probably will continue to increase but at a rate somewhat less than through the 1921–1928 period when industrial uses were expanding rapidly and central Europe was recovering from the effects of the war.

Demand for cottonseed and linters is likely to continue to increase with the growth of the population of the United States. The development of special demands for linters in the manufacture of rayon and other products has contributed to increasing the value of the cotton crop. The seed has also been increasing in value because of the expanding demand for cottonseed oil and the by-products of the oil crushings used as feedstuffs. The continued growth of specialized dairying naturally increases the demand for high-protein feedstuffs, including cottonseed meal. Cotton production in foreign countries is gradually increasing. In part this increase is due to a natural development of foreign producing areas and in part it is a result of efforts by foreign consumers to develop more stable sources of supply. Larger production abroad has increased the competition that American cotton faces in world markets. Moreover, cotton mills are increasing in oriental countries, where Indian and Chinese cottons are largely used, at the expense of mills in other countries where American cotton is chiefly used. Rayon production is increasing rapidly, stimulated in part by the great decrease that has occurred in the price of that product, but as yet it contributes only about 4 per cent to the total poundage of textile fibers used in this country.

A most notable development in the South during the last decade has been the great expansion of the cotton industry in Texas and Oklahoma, largely into range territory. In these two States alone there has been an increase of more than 6,000,000 acres in 10 years. For a time there was much speculation as to whether this development implied the extensive displacement of the industry in the older cotton States. The answer to this is suggested by the expansion in most of those same States during the last decade although stimulated by fairly good prices for cotton. The net result, combined with unfavorable demand conditions in the last year and a half, has been an accumulation of stocks of raw cotton and a price level so low that it is not unlikely to cause some temporary contraction of acreage. The real test of the ability of the industry to maintain its position in older cotton-producing areas is likely to come within the next few years. Although there is no definite information as to the potential undeveloped acreage in western Texas, it is believed to be considerable. In the old South there is a large potential cotton acreage. The release of crop acreage required to produce feed for livestock has been a factor in making available additional acreage for cotton cultivation. Much more arable land will become available through the same forces with the extension of the process of mechanization of agriculture in parts of the South.

The tendency to mechanization thus far has developed much less in the South than in the Northern and Western States. It has been delayed by serious obstacles in the system of land tenure, by the character of the farm layout, and perhaps in some sections, by unfavorable topography. Difficult financial conditions during the last 10 years have been an impediment. Nevertheless, it seems more than probable that such a tendency is due to make considerable headway in the South during the next decade. If a successful cotton picker is developed, which appears likely, it will probably stimulate other forms of mechanization and reduce the prevalence of 1-horse agriculture, as well as give rise to other far-reaching changes in farm

organization, land tenure, credit procedure, and social organization in general.

Gradual industrialization of southern economic life, particularly in the eastern portion, will tend to create a diversified community life, inducing more favorable conditions for a diversified agriculture. Judged by the proportion of the population gainfully employed in agriculture, forestry, and animal husbandry, the South is still the most predominantly rural large section of the United States. Southern manufactures have made considerable progress in certain States. Between 1914 and 1927 the number of employees increased about 50 per cent in the Carolinas, Georgia, Alabama, and Tennessee. In each of the other States, however, it was in the neighborhood of 10 per cent or less, except in Kentucky, where it amounted to about 16 per cent. The last decade has also revealed considerable increase in southern urban population.

Although this progress is noteworthy, apparently it is easy to exaggerate its significance from the standpoint of its probable early influence on southern agriculture. Its effects in providing a larger local market for southern food products are likely to be manifested gradually.

Offsetting this tendency, in part, will be the gradual reduction in the magnitude of the southern forest industries. Already there are many southern communities, formerly largely dependent on these industries for local markets or the part-time employment of farmers, that have been deprived of this resource.

The South as a whole, like the greater part of the United States, appears to be nearing the end of more than a decade of liquidation of farm real estate values from the high levels reached in 1920. In five cotton States—the Carolinas, Georgia, Mississippi, and Arkansas—the index numbers of farm real estate values for 1920 were higher than in any other State of the Union. In the other cotton States, values in 1920, although high, were much less extreme; but the border States (Kentucky and Tennessee) were notable, also, for values nearly as high as in some of the five States mentioned above. In most of the cotton States, the decline was checked and in some cases even reversed during the period of relatively high cotton prices from 1922 to 1926, inclusive. Florida experienced a second peak in 1926 because of the culmination of a general real-estate boom not primarily connected with agriculture. In Texas and Oklahoma advancing values in the newly settled sections offset somewhat declining tendencies in most of the eastern part of those States. Farmers in these newer sections, however, should proceed conservatively in valuing lands for purchase and in incurring indebtedness for that purpose.

The greatest weakness during the last year was manifested in the border States and in the Carolinas. In the remainder of the cotton South drastic liquidation appears to be nearly, if not quite, complete. Conditions in general do not justify the expectation of a considerable advance in values or even that there may not be some further recessions, particularly as a result of the extremely unfavorable prices for cotton and tobacco during the current year.

The outlook for farm real estate values is closely connected with the outlook for taxes on farm property. Farmers of every Southern

State except North Carolina paid more property taxes in 1929 than in 1928. Figures for 1930 are not yet available, but the persistent annual increases of past years indicate that the southern farmers' tax bill for 1930 and 1931 will be approximately as large and perhaps somewhat larger than in 1929.

Although farm taxes have been increasing, farm real estate values have been declining, partly because of the higher taxes. The value of farm real estate in 1929, for the United States as a whole, was almost one-third less than in 1920. In marked contrast, farm taxes in 1929 were nearly two-thirds greater than in 1920. The Southern States have experienced similar trends. Real estate values in most Southern States declined slightly between 1928 and 1929, and in others they remained stationary during the same period.

Increasing taxes coincident with declining real estate values have resulted in pronounced increases in the "true tax rates" (the ratios of real-estate taxes to true values as distinguished from assessed values). The true farm tax rate for the United States as a whole increased from 0.68 in 1913 to 1.22 in 1924 and to 1.46 in 1929. The 1929 rates as well as the increases since 1913 are less for all three groups of Southern States than for the country as a whole. Since 1924, however, the increase has been about average for the East South Central and above average in the South Atlantic States. The increase in the West South Central States has been below average since both 1913 and 1924.

In the South Central States, 1928 taxes on farm property absorbed 11.9 per cent of net farm returns (before deducting taxes)—a smaller proportion than for any other geographic division. Moreover, the ratio of taxes to net farm returns for the South Central States was relatively low every year between 1922 and 1928, chiefly because per capita expenditures for schools and roads as yet have not reached the high level attained in other sections.

Reduction in the amount of farm taxes is distinctly unlikely. Substantial reduction can take place only as a result of far-reaching modifications in fiscal policy, and it is not likely to be an easy matter to prevent increases, particularly in those States whose school and highway programs are less fully developed than in the Nation at large. Past experience in no way precludes the possibility of radical changes in public fiscal policy: but to the extent that the future is to be judged by the past, the most optimistic prediction is that taxes in most Southern States will continue to increase for some time.

The farm-mortgage debt of the three southern geographic divisions increased from $556,000,000 in 1910 to $1,371,000,000 in 1920, to $1,656,000,000 in 1925, and to $1,775,000,000 in 1928, respective increases of 149 per cent, 20 per cent, and 8 per cent. The South Atlantic increases were 147 per cent, 26 per cent, and 12 per cent. This is the most steady rise of mortgage debt of all principal areas. Although the percentage of farms mortgaged (1925, averaged 28.1 per cent; 1928, 30.4 per cent) is still generally lower in the South than in other regions, the rate of increase has been greatest in that region. The South Atlantic region during this period increased the proportion of its mortgaged farms from 23.4 per cent to 26 per cent. In proportion to number of farms mortgaged, foreclosures for debt are more frequent there than in any other region. This is true de-

spite a lower ratio of debt to value for farms mortgaged (37.1 per cent as compared with 41.9 per cent for the whole United States). A decrease of 8.5 per cent in the farms of that area since 1920 suggests that adjustment of the farming unit is necessary to profitable operation.

An indicated decline of 5 per cent in the outstanding loans of the operations of insurance companies in 11 Southern States during 1929 suggests that leading lending agencies will restrict new credit to the preferred risks.

Merchant and dealer credit has remained a larger proportion of the short-term credit used in the South than elsewhere. The current season's prospect is for an increased use of this expensive form of credit, especially for fertilizer purchases. Manufacturers estimate that 65 per cent of their dealers will require credit for this purpose in 1931, as compared with 44 per cent in 1930.

ORGANIZATION OF THE UNITED STATES DEPARTMENT OF AGRICULTURE WHEN THIS PUBLICATION WAS LAST PRINTED

Secretary of Agriculture	ARTHUR M. HYDE.
Assistant Secretary	R. W. DUNLAP.
Director of Scientific Work	A. F. WOODS.
Director of Regulatory Work	WALTER G. CAMPBELL.
Director of Extension Work	C. W. WARBURTON.
Director of Personnel and Business Administration.	W. W. STOCKBERGER.
Director of Information	M. S. EISENHOWER.
Solicitor	E. L. MARSHALL.
Weather Bureau	CHARLES F. MARVIN, *Chief.*
Bureau of Animal Industry	JOHN R. MOHLER, *Chief.*
Bureau of Dairy Industry	O. E. REED, *Chief.*
Bureau of Plant Industry	WILLIAM A. TAYLOR, *Chief.*
Forest Service	R. Y. STUART, *Chief.*
Bureau of Chemistry and Soils	H. G. KNIGHT, *Chief.*
Bureau of Entomology	C. L. MARLATT, *Chief.*
Bureau of Biological Survey	PAUL G. REDINGTON, *Chief.*
Bureau of Public Roads	THOMAS H. MACDONALD, *Chief.*
Bureau of Agricultural Economics	NILS A. OLSEN, *Chief.*
Bureau of Home Economics	LOUISE STANLEY, *Chief.*
Plant Quarantine and Control Administration	LEE A. STRONG, *Chief.*
Grain Futures Administration	J. W. T. DUVEL, *Chief.*
Food and Drug Administration	WALTER G. CAMPBELL, *Director of Regulatory Work, in Charge.*
Office of Experiment Stations	————, *Chief.*
Office of Cooperative Extension Work	C. B. SMITH, *Chief.*
Library	CLARIBEL R. BARNETT, *Librarian.*

This circular is a contribution from

Bureau of Agricultural Economics	NILS A. OLSEN, *Chief.*

U. S. GOVERNMENT PRINTING OFFICE: 1930